



Environmental Remediation Group

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SENT VIA ELECTRONIC MAIL

April 2, 2020

Ms. Lynne Jennings and Ms. Melanie Morash
U. S. Environmental Protection Agency (USEPA), Region 1
5 Post Office Square, Suite 100,
Mail Stop OSRR07-4, Boston, MA 02109-3912

**RE: Hexavalent Chromium in Groundwater, Surface Water, Sediment, and Soil
Olin Chemical Superfund Site (OCSS; "Site") – Wilmington, MA**

Dear Ms. Jennings and Ms. Morash:

The technical memorandum enclosed herewith evaluates reported hexavalent chromium detections in groundwater, surface water, sediment, and soil at the Olin Chemical Superfund Site (OCSS). The evaluation was conducted as discussed and agreed to between USEPA and Olin. The evaluation concludes that hexavalent chromium is not a chemical of concern in the referenced media at the Site and therefore no evaluation of remedial alternatives is needed for this chemical.

Let us know if you have any questions.

Sincerely,
OLIN CORPORATION

A handwritten signature in black ink, appearing to read "J".

James M. Cashwell
Director, Environmental Remediation

Enclosure

cc: Chinny Esakkiperumal (Olin)
Libby Bowen (Wood)

Technical Memorandum

To: Chinny Esakkiperumal
From: Michael Murphy, Jane Parkin Kullmann
cc: Nelson Walter
Date: April 2, 2020
Re: **Hexavalent Chromium in Groundwater, Surface Water, Sediment, and Soil at the Olin Chemical Superfund Site**

Reviewer: Elizabeth Bowen
Wood File No.: 6107200016

1.0 Introduction, Purpose, and Summary

This technical memorandum has been prepared to document the evaluation of hexavalent chromium in environmental media to support the on-going preparation of the Feasibility Study (FS) for Operable Unit 1 (OU1) and Operable Unit 2 (OU2) and of the Interim Action Feasibility Study (IAFS) for the Olin Chemical Superfund Site (OCSS). This evaluation has been conducted to evaluate whether hexavalent chromium should be considered a Chemical of Concern (COC) in soil, groundwater, surface water, and sediment. Human health and ecological risks (including an assessment of Applicable and Relevant and Appropriate Requirements (ARARs)), potential impacts from soil to groundwater, and potential impacts to surface water and sediment associated with groundwater discharge (particularly the South Ditch and East Ditch) were considered.

To date, human health and ecological risk assessments and ARAR evaluations included in the Final Remedial Investigation (RI) Report for OU1 and OU2 (Amec Environment & Infrastructure, Inc. (Amec), 2015) and the Revised RI Report for OU3 (Wood Environment & Infrastructure, Inc. (Wood, 2019) concluded that hexavalent chromium should not be considered a COC for media in OU1 and OU2 or in OU3. The current evaluation concluded the same. The remainder of this memorandum summarizes the specific findings of the current evaluation. Sections 2.0, 3.0, 4.0, and 5.0 address groundwater, surface water, sediment and soil, respectively, and section 6.0 presents the conclusion that hexavalent chromium is not a chemical of concern for groundwater, surface water, sediment, and soil at the Site and therefore the FS for OU1 and OU2 and the IAFS need not develop and evaluate remedial alternatives for this chemical.

The findings of the review are summarized below. A brief summary of the fate and transport of hexavalent chromium in the environment is also provided.

2.0 Groundwater

A comprehensive groundwater sampling program was conducted at the Site in spring 2019. **Table 1** identifies the monitoring well samples that were analyzed for total and hexavalent chromium in that sampling event.

Table 2 provides the total and hexavalent chromium data for the 90 samples (86 field samples plus four field duplicate samples) that were analyzed. Hexavalent chromium was not detected in any of the samples at a reporting limit of 10 µg/L (which is below the chronic freshwater aquatic toxicity criterion value of 11 µg/L). In 45 of the 90 samples, there was no total chromium present with a detection limit of 1 µg/L, indicating that the



hexavalent chromium concentrations were also less than 1 µg/L in these 45 samples. It should be noted that there are several samples included in **Table 2** that were collected from multi-level piezometers and other monitoring wells screened in dense aqueous phase liquid (DAPL). Those samples have substantial concentrations of total chromium that are not representative of chromium concentrations in groundwater outside of the footprints of the DAPL pools.

The Revised RI Report for OU3 (Wood, 2019) presented the analytical data for hexavalent chromium, in shallow overburden groundwater, deep overburden groundwater, and bedrock groundwater, in Appendix E-1, E-2, and E-3 respectively. In past sampling events, hexavalent chromium was detected in groundwater sporadically, with no apparent correlation with total chromium concentrations and at locations that were not consistent with historical waste disposal activities. Figures 4.4.6-5a, 4.4.6-5b, and 4.4.6-5c of the June 2019 OU3 RI Report are included in **Attachment A** of this memorandum, and these figures show the distribution of hexavalent chromium detections in shallow overburden groundwater, deep overburden groundwater, and bedrock groundwater. The sporadic detections of hexavalent chromium in groundwater samples did not suggest any specific source area nor any apparent concentration gradients that might be indicative of migration from a source.

The information above regarding results of historical hexavalent chromium sampling are reinforced by the results of recent groundwater sampling at the site. The results of the comprehensive groundwater sampling and analysis program completed in the Spring 2019 are discussed below.

- Hexavalent chromium was not detected in any of the 90 groundwater samples analyzed for hexavalent chromium collected in the Spring 2019 comprehensive groundwater sampling event.
 - The laboratory reporting limit for hexavalent chromium in those groundwater samples, as discussed above, was typically 0.01 mg/L (or 10 µg/L), which is below the surface water NRWQC for hexavalent chromium of 11 µg/L. The laboratory analysis was sufficiently sensitive to detect any concentrations of potential concern for aquatic receptors in receiving surface water.
 - The percent recoveries of spiked hexavalent chromium in Spring 2019 groundwater samples were generally within laboratory QC percent recovery limits of 90% - 110%. This information indicates that if hexavalent chromium were present in the collected Spring 2019 groundwater samples, the laboratory analysis would detect it (not an indication of any false negatives).
 - DAPL is potentially considered the source media responsible for contributing chromium and other COCs to the groundwater. The DAPL data indicate an absence of a hexavalent chromium source at concentrations of potential concern.
 - The Draft Baseline Human Health Risk Assessment (BHHRA) in the Draft Remedial Investigation Report for OU3 concluded risks associated with potential exposure to hexavalent chromium in groundwater at the Property (construction worker) are insignificant (cancer risk less than 10^{-6} and Hazard Index well below 1). In the Draft BHHRA hexavalent chromium was conservatively assumed to be present even though the reported detections in groundwater were considered to be false positives).

3.0 Surface Water

The Final Remedial Investigation Report for OU1 and OU2 (Amec, 2015) presents the surface water analytical data tables (Table 4.1-4 through 4.1-6 for OU1 and 4.2-3 through 4.2-6 for OU2), and includes a figure showing hexavalent chromium distribution in surface water at the Site (Figure 4.1-33). These data tables and figure are included in **Attachment B** of this memorandum.

- Hexavalent chromium was detected infrequently and at very low concentrations in surface water samples (detected in 2 of 23 samples) collected between 2003 and 2012 from the South Ditch and East Ditch.

- The two detections of hexavalent chromium were reported as lab-estimated concentrations (below the reporting limit and above the MDL) of 0.56 J µg/L and 0.86 J µg/L, which are well below the NRWQC of 11 µg/L.
- The laboratory reporting limit for hexavalent chromium in those surface water samples included in the RI tables ranged from 1 µg/L to 5 µg/L, all below the 11 µg/L surface water NRWQC for hexavalent chromium. The laboratory analysis was sufficiently sensitive to detect any concentrations of potential concern.
- Since the surface water of the two ditches is the receiving water body for potential groundwater/surface water interaction at South Ditch and East Ditch, the surface water data indicate the absence of hexavalent chromium at concentrations of potential concern with respect to ecological receptors associated with groundwater/surface water interaction.
- The BHHRA (Appendix M of the Final Remedial Investigation Report for OU1 and OU2) concluded cancer risks and non-cancer hazard associated with potential exposure to all COPCs in surface water of the South Ditch and East Ditch (trespassers) and all other water bodies were below the upper end of the CERCLA risk range and Hazard Index of 1. The BHHRA concluded that risks and hazard associated with hexavalent chromium in surface water were insignificant.
- The Baseline Ecological Risk Assessment (BERA), which is Appendix N of the Final Remedial Investigation Report for OU1 and OU2, concluded that adverse effects to aquatic receptors was possible due to ammonia and chromium (not hexavalent chromium) in surface water of the Upper South Ditch and Lower South Ditch. As indicated in Attachments 1-5 through 1-8 of the BERA, hexavalent chromium was not detected in surface water samples from the South Ditch, Central Pond, and the Off-Property West Ditch. Reporting limits ranged from 1 µg/L to 5 µg/L (all below the NRWQC for hexavalent chromium of 11 µg/L). As shown in Attachment 1-7 of the BERA, hexavalent chromium was detected at 10 mg/L (below the NRWQC) in the single surface water sample collected from the Stormwater Detention Basin. Because most results were non-detects and the only detection was below the NRWQC, hexavalent chromium was not selected as an ecological chemical of potential concern for surface water for the BERA.
- The surface water data are further confirmation that groundwater/surface water interaction is not a concern for hexavalent chromium.

4.0 Sediment

The Final Remedial Investigation Report for OU1 and OU2 (Amec, 2015) presents the analytical data tables (Tables 4.1-7 through 4.1-9a for OU1 and Tables 4.2-7 through 4.2-9a for OU2) and a figure showing the distribution of hexavalent chromium in sediment at the Site (Figure 4.1-43. These data tables and figure are included in **Attachment C** of this memorandum.

- During the OU1/OU2 RI, hexavalent chromium was detected in 3 of 6 sediment samples from the Upper South Ditch and 4 of 5 sediment samples from the un-remediated Lower South Ditch. Upper and Lower South Ditch average hexavalent chromium concentrations were 7 mg/kg and 14.5 mg/kg (maximum 28 mg/kg), respectively. Hexavalent chromium was not detected in the sediment sample from the Off-Property West Ditch or in sediment in the Stormwater Detention Basin (reporting limit <0.36 mg/kg). Hexavalent chromium was detected in the two samples from Central Pond (0.21 mg/kg and 0.27 mg/kg). The sediment data were reported in the Attachments 1-11 to 1-16 of the BERA.
- The BHHRA in the Final Remedial Investigation Report for OU1 and OU2 concluded cancer risks and non-cancer hazard associated with potential exposure to all COPCs in South Ditch sediment and East Ditch (trespassers) and all other water bodies were below the upper end of the CERCLA risk range and

Hazard Index of 1. The BHHRA concluded that risks and hazard associated with hexavalent chromium in sediment were insignificant.

- The BERA in the Final Remedial Investigation Report for OU1 and OU2 concluded that adverse effects to aquatic receptors was possible due to chromium (not hexavalent chromium) and bis-2-ethylhexyl phthalate in sediment of the Lower South Ditch. There were no Hazard Index values above 1 for hexavalent chromium in sediment in the BERA food chain modeling evaluations for all of the water bodies evaluated. The food chain modeling evaluations were considered to have high weight and high level of certainty among the assessment endpoints and therefore were the basis of the ecological PRGs for sediment for chromium (not hexavalent chromium) and BEHP. The BERA results indicate that hexavalent chromium in sediment at the Site is not an ecological concern.

5.0 Soil

The presence and distribution of hexavalent chromium concentrations in soil in OU1 and OU2 were extensively investigated. The distribution of hexavalent chromium in surface soil, shallow subsurface soil, and deep subsurface soil were shown in Figures 4.1-8 through 4.1-10 of the Final Remedial Investigation Report for OU1 and OU2. These figures have been included in **Attachment D-1** of this memorandum. In addition, there is a detailed presentation and discussion of the presence and distribution of concentrations of hexavalent chromium in soil in Attachment 7 - Chromium Evaluation of the BHHRA included in the Final Remedial Investigation Report for OU1 and OU2. **Attachment D-2** of this memorandum includes Attachment 7 of the BHHRA.

- Hexavalent chromium was detected in 93 of the 142 soil samples from the Site that were analyzed for hexavalent chromium. The Industrial Regional Screening level (RSL) for hexavalent chromium is 5.6 mg/kg (based on 1×10^{-6} cancer risk). The soil hexavalent chromium site-wide arithmetic mean is 17.76 mg/kg and the range of concentrations is "not detected" to 1,100 mg/kg.
 - The 1,100 mg/kg result in sample SS-445 was further investigated by additional sampling and analysis (samples SB-526 through SB-529 as shown on Figure 4.1-8 in **Attachment D-1**) and hexavalent chromium was not detected in three of those samples while the concentration in sample SB-528 closest to SS-445 was 19 mg/kg. The additional investigation in the vicinity of 1,100 mg/kg result indicates that the referenced SS-445 result is anomalous and represents a very small area of soil in the wetland area of EA5. See box plots included in **Attachment D-2**.
 - The Baseline Human Health Risk Assessment concluded that estimated cancer risk and non-cancer Hazard Index for all chemicals of potential concern in soil (including hexavalent chromium) were within the CERCLA risk range (10^{-6} to 10^{-4}) and below the target Hazard Index of 1, respectively.
 - USEPA and MassDEP identified a hexavalent chromium soil concentration of 200 mg/kg as a level of concern for potential allergic contact dermatitis. The Massachusetts Contingency Plan Method 1 Category S-2 soil standard for hexavalent chromium is based on this allergic contact dermatitis endpoint. Among the 142 soil samples tested for hexavalent chromium, only one soil sample had a concentration above 200 mg/kg. That sample had a reported concentration of 1,100 mg/kg concentration (discussed above) and that sample was subsequently bounded by additional samples with concentrations below 200 mg/kg. The single soil concentration above 200 mg/kg is an anomaly and is not considered a substantial risk to health. That sample is located within the off-site exposure area EA-5 and the soil in the vicinity of that sample has been identified in the Feasibility Study for OU1 and OU2 as an area to be remediated because of concentrations of total chromium and BEHP that are above ecological risk-based concentrations.
- Leaching of hexavalent chromium from soil to groundwater and subsequently to surface water is not a concern at the Site.

- Hexavalent chromium is generally considered as soluble and mobile – however, in the Spring 2019 Comprehensive Groundwater Sampling event, hexavalent chromium was not detected in any of the 90 groundwater samples analyzed for hexavalent chromium. Reporting limits for the groundwater samples were below the NRWQC of 11 µg/L Protective of aquatic life in surface water. This indicates that leaching of hexavalent chromium to groundwater at concentrations of concern for receiving surface water is not occurring at the Site.

6.0 Conclusions

Overall, the analytical data and the Site conditions indicate that hexavalent chromium should not be considered as a COC for groundwater, surface water, sediment, and soil at the Site. The site chemical analytical data, pH, and observed redox conditions support an expectation that the dominant and stable form of chromium is currently, and is expected to remain, trivalent. The evaluation of human health and ecological risks has identified total chromium as a COC in groundwater, surface water, sediment, and soil at the Site. The overall low frequency of detection and generally low concentrations of hexavalent chromium lead to the conclusion that hexavalent chromium at the Site is not a significant contributor to human health or ecological risk and therefore hexavalent chromium is not a Site COC.

7.0 References

AMEC Environment & Infrastructure, Inc. (AMEC), 2015a. Final Remedial Investigation Report, Operable Unit 1 & Operable Unit 2, Olin Chemical Superfund Site, Wilmington, Massachusetts, July.

AMEC Environment & Infrastructure, Inc. (AMEC), 2013. Screening Level Ecological Risk Assessment East Ditch, Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts, July. This document is Attachment 7 to the Baseline Ecological Risk Assessment that was included as Appendix N to the Final Remedial Investigation Report (AMEC, 2015a).

Wood Environment & Infrastructure Solutions, Inc., 2019. Revised Remedial Investigation Report, Operable Unit 3, Olin Chemical Superfund Site, Wilmington, Massachusetts, June.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Prepared by:



Michael Murphy
Principal Risk Assessor

Reviewed by:


Elizabeth Bowen
Senior Project Manager

TABLES



Table 1 - Sample Summary
Data Validation Report
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| TAL SDG # | Lancaster SDG # | Location | Field Sample ID | Sample Date | Media | Method Class | Metals | | Metals | | Cr+6 SW7199 Count | |
|-------------------------------|-----------------|-----------|------------------|-------------|-------|--------------|-----------------|----------|------------|------------|-------------------------|---|
| | | | | | | | Analysis Method | SW6010 | | SW6020 | | |
| | | | | | | | | Fraction | T Count | D Count | T Count | |
| 480-150896-1 | | GW-58D | OC-GW-58D-XXX | 3/26/2019 | GW | FS | | | | | | |
| 480-150981-1 | 2035628 | GW-415BR | OC-GW-415BR-XXX | 3/26/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2035628 | GW-65BRDS | OC-GW-65BRDS-XXX | 3/26/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2035628 | MP-2 #15 | OC-MP-2 #15-XXX | 3/26/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | | QC | OC-TB-032719 | 3/27/2019 | BW | TB | | | | | | |
| 480-150981-1 | 2035847 | MP-2 #11 | OC-MP-2 #11-XXX | 3/27/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2035847 | GW-413S | OC-GW-413S-XXX | 3/27/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2035847 | GW-63D | OC-GW-63D-XXX | 3/27/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2035847 | MP-2 #07 | OC-MP-2 #7-XXX | 3/27/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2035847 | GW-413BR | OC-GW-413BR-DUP | 3/27/2019 | GW | FD | 6 | | 1 | | | 1 |
| 480-150981-1 | 2035847 | GW-413BR | OC-GW-413BR-XXX | 3/27/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2035847 | GW-103D | OC-GW-103D-XXX | 3/27/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2035847 | GW-80D | OC-GW-80D-XXX | 3/27/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2035847 | MP-2 #06 | OC-MP-2 #6-XXX | 3/27/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2035847 | GW-80BR | OC-GW-80BR-XXX | 3/27/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2035847 | GW-61D | OC-GW-61D-XXX | 3/27/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1, 480-151044-1 | 2035847 | MP-2 #04 | OC-MP-2 #4-XXX | 3/27/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2035847 | GW-103BR | OC-GW-103BR-XXX | 3/27/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2036029 | GW-80S | OC-GW-80S-XXX | 3/28/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1, 480-151044-1 | 2036029 | MP-2 #03 | OC-MP-2 #3-XXX | 3/28/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | | QC | OC-TB-032819 | 3/28/2019 | BW | TB | | | | | | |
| 480-150981-1 | 2036029 | GW-61BR | OC-GW-61BR-XXX | 3/28/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1, 480-151044-1 | 2036029 | MP-2 #01 | OC-MP-2 #1-XXX | 3/28/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2036029 | GW-44S | OC-GW-44S-XXX | 3/28/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1, 480-151044-1 | 2036029 | GW-44D | OC-GW-44D-XXX | 3/28/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2036029 | MP-3 #21 | OC-MP-3 #21-XXX | 3/28/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-150981-1 | 2036029 | MP-4 #14 | OC-MP-4 #14-XXX | 3/28/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | 2036029 | MP-4 #11 | OC-MP-4#11-XXX | 3/28/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | 2036029 | MP-3 #20 | OC-MP-3#20-XXX | 3/28/2019 | GW | FS | 6 | 6 | 1 | 1 | 1 | 1 |
| 480-151084-1 | | QC | OC-TB-032919 | 3/29/2019 | BW | TB | | | | | | |
| 480-151084-1 | 2036334 | MP-4 #13 | OC-MP-4#13-XXX | 3/29/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | 2036334 | MP-3 #19 | OC-MP-3#19-XXX | 3/29/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1, 480-151084-2 | 2036334 | GW-62D | OC-GW-62D-XXX | 3/29/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | 2036334 | GW-62S | OC-GW-62S-XXX | 3/29/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | 2036334 | GW-402D | OC-GW-402D-XXX | 3/29/2019 | GW | FS | 6 | 6 | 1 | 1 | 1 | 1 |
| 480-151084-1 | 2036334 | MP-4 #12 | OC-MP-4#12-XXX | 3/29/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | 2036334 | MP-3 #18 | OC-MP-3#18-XXX | 3/29/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | 2036334 | GW-62M | OC-GW-62M-XXX | 3/29/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | | QC | OC-TB-040119 | 4/1/2019 | BW | TB | | | | | | |
| 480-151084-1 | 2036580 | MP-3 #17 | OC-MP-3 #17-DUP | 4/1/2019 | GW | FD | 6 | | 1 | | | 1 |
| 480-151084-1 | 2036580 | MP-3 #17 | OC-MP-3 #17-XXX | 4/1/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1, 480-151150-2 | 2036580 | MP-4 #05 | OC-MP-4 #5-XXX | 4/1/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1, 480-151150-2 | 2036580 | MP-4 #03 | OC-MP-4 #3-XXX | 4/1/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | 2036580 | MP-3 #16 | OC-MP-3 #16-XXX | 4/1/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1, 480-151196-2 | 2036580 | MP-4 #02 | OC-MP-4#2-XXX | 4/1/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | | QC | OC-TB-040219 | 4/2/2019 | BW | TB | | | | | | |

Table 1 - Sample Summary
Data Validation Report
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| TAL SDG # | Lancaster SDG # | Location | Field Sample ID | Sample Date | Media | Method Class | Metals | | Metals | | Cr+6 SW7199 Count | |
|-------------------------------|-----------------|-----------|------------------|-------------|-------|--------------|-----------------|----------|------------|------------|-------------------------|---|
| | | | | | | | Analysis Method | SW6010 | | SW6020 | | |
| | | | | | | | | Fraction | T Count | D Count | T Count | |
| 480-151084-1, 480-151196-2 | 2036828 | MP-4 #10 | OC-MP-4#10-XXX | 4/2/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | | GW-6S | OC-GW-6S-XXX | 4/2/2019 | GW | FS | | | | | | |
| 480-151084-1, 480-151196-2 | 2036828 | GW-62BRD | OC-GW-62BRD-XXX | 4/2/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | 2036828 | MP-3 #15 | OC-MP-3#15-XXX | 4/2/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | | GW-35S | OC-GW-35S-XXX | 4/2/2019 | GW | FS | | | | | | |
| 480-151084-1, 480-151196-2 | 2036828 | GW-62BR | OC-GW-62BR-XXX | 4/2/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | | GW-408D | OC-GW-408D-XXX | 4/2/2019 | GW | FS | | | | | | |
| 480-151084-1 | 2036828 | MP-3 #14 | OC-MP-3#14-XXX | 4/2/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | | GW-35D | OC-GW-35D-XXX | 4/2/2019 | GW | FS | | | | | | |
| 480-151084-1 | | GW-307 | OC-GW-307-XXX | 4/2/2019 | GW | FS | | | | | | |
| 480-151084-1 | 2036828 | GW-82S | OC-GW-82S-XXX | 4/2/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | 2036828 | MP-3 #13 | OC-MP-3#13-XXX | 4/2/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151084-1 | | GW-10DR | OC-GW-10DR-XXX | 4/2/2019 | GW | FS | | | | | | |
| 480-151289-1 | | QC | OC-TB-040319 | 4/3/2019 | BW | TB | | | | | | |
| 480-151289-1 | 2037081 | MP-3 #12 | OC-MP-3 #12-XXX | 4/3/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151289-1 | 2037081 | GW-82D | OC-GW-82D-XXX | 4/3/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151289-1 | 2037081 | MP-3 #11 | OC-MP-3 #11-XXX | 4/3/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151289-1 | 2037081 | GW-406BRS | OC-GW-406BRS-XXX | 4/3/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151289-1 | 2037081 | GW-57D | OC-GW-57D-DUP | 4/3/2019 | GW | FD | 6 | | 1 | | | 1 |
| 480-151289-1 | 2037081 | GW-57D | OC-GW-57D-XXX | 4/3/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151289-1 | 2037081 | GW-406BRD | OC-GW-406BRD-XXX | 4/3/2019 | GW | FS | 6 | 6 | 1 | 1 | | 1 |
| 480-151289-1 | 2037081 | MP-3 #10 | OC-MP-3 #10-XXX | 4/3/2019 | GW | FS | 6 | 6 | 1 | 1 | | 1 |
| 480-151289-1 | | QC | OC-TB-040419 | 4/4/2019 | BW | TB | | | | | | |
| 480-151289-1 | 2037371 | MP-3 #09 | OC-MP-3 #9-XXX | 4/4/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151289-1 | 2037371 | MP-3 #08 | OC-MP-3 #8-XXX | 4/4/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151289-1, 480-151400-2 | 2037371 | MP-3 #07 | OC-MP-3 #7-XXX | 4/4/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151289-1, 480-151400-2 | 2037371 | MP-3 #06 | OC-MP-3 #6-XXX | 4/4/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151289-1, 480-151400-2 | 2037371 | MP-3 #05 | OC-MP-3 #5-XXX | 4/4/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151289-1, 480-151400-2 | 2037371 | MP-3 #04 | OC-MP-3 #4-XXX | 4/4/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151289-1, 480-151453-2 | 2037371 | MP-3 #03 | OC-MP-3#3-XXX | 4/4/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151289-1 | 2037371 | MP-2 #09 | OC-MP-2 #9-XXX | 4/4/2019 | GW | FS | 6 | 6 | 1 | 1 | | 1 |
| 480-151289-1 | | QC | OC-TB-040519 | 4/5/2019 | BW | TB | | | | | | |
| 480-151289-1, 480-151453-2 | 2037653 | MP-3 #02 | OC-MP-3#2-XXX | 4/5/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-151289-1, 480-151453-2 | 2037653 | MP-3 #01 | OC-MP-3#1-XXX | 4/5/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | | QC | OC-TB-042419 | 4/24/2019 | BW | TB | | | | | | |
| 480-152464-1 | 2040507 | MW-204M | OC-MW-204M-XXX | 4/24/2019 | GW | FS | 6 | 6 | 1 | 1 | | 1 |
| 480-152464-1 | 2040507 | MW-204D | OC-MW-204D-XXX | 4/24/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2040507 | MW-204S | OC-MW-204S-XXX | 4/24/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2040507 | MW-204BR | OC-MW-204BR-XXX | 4/24/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | | QC | OC-TB-042919 | 4/29/2019 | BW | TB | | | | | | |
| 480-152464-1 | 2041242 | GW-87D | OC-GW-87D-XXX | 4/29/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2041242 | GW-86D | OC-GW-86D-XXX | 4/29/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2041242 | GW-86S | OC-GW-86S-XXX | 4/29/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2041242 | GW-86M | OC-GW-86M-XXX | 4/29/2019 | GW | FS | 6 | | 1 | | | 1 |

Table 1 - Sample Summary
Data Validation Report
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| TAL SDG # | Lancaster SDG # | Location | Field Sample ID | Sample Date | Media | Method Class | Metals | | Metals | | Cr+6 SW7199 Count | |
|-------------------------------|-----------------|----------|-----------------|-------------|-------|--------------|-----------------|----------|------------|------------|-------------------------|---|
| | | | | | | | Analysis Method | SW6010 | | SW6020 | | |
| | | | | | | | | Fraction | T Count | D Count | T Count | |
| 480-152464-1 | | QC | OC-TB-043019 | 4/30/2019 | BW | TB | | | | | | |
| 480-152464-1 | 2041447 | MP-5 #15 | OC-MP-5 #15-XXX | 4/30/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | | MP-5 #15 | OC-MP-5#15-XXX | 4/30/2019 | GW | FS | | | | | | |
| 480-152464-1 | 2041447 | GW-88M | OC-GW-88M-XXX | 4/30/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2041447 | MP-5 #12 | OC-MP-5 #12-XXX | 4/30/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2041447 | MP-5 #11 | OC-MP-5 #11-XXX | 4/30/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2041447 | GW-88D | OC-GW-88D-XXX | 4/30/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2041447 | MP-5 #08 | OC-MP-5 #8-XXX | 4/30/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | | QC | OC-TB-050119 | 5/1/2019 | BW | TB | | | | | | |
| 480-152464-1 | 2041644 | GW-83S | OC-GW-83S-XXX | 5/1/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2041644 | GW-84S | OC-GW-84S-DUP | 5/1/2019 | GW | FD | 6 | | 1 | | | 1 |
| 480-152464-1 | 2041644 | GW-84S | OC-GW-84S-XXX | 5/1/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2041644 | GW-83M | OC-GW-83M-XXX | 5/1/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2041644 | GW-84M | OC-GW-84M-XXX | 5/1/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1, 480-152813-2 | 2041644 | GW-83D | OC-GW-83D-XXX | 5/1/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1, 480-152813-2 | 2041644 | GW-84D | OC-GW-84D-XXX | 5/1/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | | QC | OC-TB-050219 | 5/2/2019 | BW | TB | | | | | | |
| 480-152464-1, 480-152899-2 | 2041878 | MP-5 #06 | OC-MP-5 #6-XXX | 5/2/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2041878 | GW-85M | OC-GW-85M-XXX | 5/2/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1, 480-152899-2 | 2041878 | MP-5 #03 | OC-MP-5 #3-XXX | 5/2/2019 | GW | FS | 6 | | 1 | | | 1 |
| 480-152464-1 | 2041878 | GW-85D | OC-GW-85D-XXX | 5/2/2019 | GW | FS | 6 | | 1 | | | 1 |

Notes:

SDG = Sample Delivery Group

FS = Field Sample

FD = Field Duplicate

TB = Trip Blank

GW = Groundwater

BW = Blank Water

Fraction = D-Dissolved T- Total N- Normal

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | GW-103BR | GW-103D | GW-402D | GW-406BRD | GW-406BRS | GW-413BR |
|-----------------------------|----------|-------|-----------------|----------------|----------------|------------------|------------------|-----------------|
| Lab SDG Chromium | | | 480-150981-1 | 480-150981-1 | 480-151084-1 | 480-151289-1 | 480-151289-1 | 480-150981-1 |
| Lab SDG Hexavalent Chromium | | | 2035847 | 2035847 | 2036334 | 2037081 | 2037081 | 2035847 |
| Sample Date | | | 3/27/2019 | 3/27/2019 | 3/29/2019 | 4/3/2019 | 4/3/2019 | 3/27/2019 |
| Sample ID | | | OC-GW-103BR-XXX | OC-GW-103D-XXX | OC-GW-402D-XXX | OC-GW-406BRD-XXX | OC-GW-406BRS-XXX | OC-GW-413BR-DUP |
| QC Code | | | FS | FS | FS | FS | FS | FD |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| Chromium | T | ug/l | 5 U | | 5 U | 10 | 1.2 J | 5 U |
| Chromium, Hexavalent | T | ug/l | 10 U | | 10 U | 10 UJ | 10 U | 10 U |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | GW-413BR | GW-413S | GW-415BR | GW-44D | GW-44S | GW-57D |
|-----------------------------|----------|-------|-----------------|----------------|-----------------|---------------|---------------|---------------|
| Lab SDG Chromium | | | 480-150981-1 | 480-150981-1 | 480-150981-1 | 480-150981-1 | 480-150981-1 | 480-151289-1 |
| Lab SDG Hexavalent Chromium | | | 2035847 | 2035847 | 2035628 | 2036029 | 2036029 | 2037081 |
| Sample Date | | | 3/27/2019 | 3/27/2019 | 3/26/2019 | 3/28/2019 | 3/28/2019 | 4/3/2019 |
| Sample ID | | | OC-GW-413BR-XXX | OC-GW-413S-XXX | OC-GW-415BR-XXX | OC-GW-44D-XXX | OC-GW-44S-XXX | OC-GW-57D-DUP |
| QC Code | | | FS | FS | FS | FS | FS | FD |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| Chromium | T | ug/l | 5 U | J | 5 U | 440,000 | 19 | 5 U |
| Chromium, Hexavalent | T | ug/l | 10 U | UJ | 10 U | 10 U | 10 U | 10 U |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | GW-57D | GW-61BR | GW-61D | GW-62BR | GW-62BRD | GW-62D |
|-----------------------------|----------|-------|---------------|----------------|---------------|----------------|-----------------|---------------|
| Lab SDG Chromium | | | 480-151289-1 | 480-150981-1 | 480-150981-1 | 480-151084-1 | 480-151084-1 | 480-151084-1 |
| Lab SDG Hexavalent Chromium | | | 2037081 | 2036029 | 2035847 | 2036828 | 2036828 | 2036334 |
| Sample Date | | | 4/3/2019 | 3/28/2019 | 3/27/2019 | 4/2/2019 | 4/2/2019 | 3/29/2019 |
| Sample ID | | | OC-GW-57D-XXX | OC-GW-61BR-XXX | OC-GW-61D-XXX | OC-GW-62BR-XXX | OC-GW-62BRD-XXX | OC-GW-62D-XXX |
| QC Code | | | FS | FS | FS | FS | FS | FS |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| Chromium | T | ug/l | 5 U | | 5 U | | 1.9 J | 5 U |
| Chromium, Hexavalent | T | ug/l | 10 U | | 10 U | | 10 U | 10 UJ |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | GW-62M | GW-62S | GW-63D | GW-65BRDS | GW-80BR | GW-80D |
|-----------------------------|----------|-------|---------------|---------------|---------------|------------------|----------------|---------------|
| Lab SDG Chromium | | | 480-151084-1 | 480-151084-1 | 480-150981-1 | 480-150981-1 | 480-150981-1 | 480-150981-1 |
| Lab SDG Hexavalent Chromium | | | 2036334 | 2036334 | 2035847 | 2035628 | 2035847 | 2035847 |
| Sample Date | | | 3/29/2019 | 3/29/2019 | 3/27/2019 | 3/26/2019 | 3/27/2019 | 3/27/2019 |
| Sample ID | | | OC-GW-62M-XXX | OC-GW-62S-XXX | OC-GW-63D-XXX | OC-GW-65BRDS-XXX | OC-GW-80BR-XXX | OC-GW-80D-XXX |
| QC Code | | | FS | FS | FS | FS | FS | FS |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| Chromium | T | ug/l | 5 U | | 5 U | | 5 U | 1.9 J |
| Chromium, Hexavalent | T | ug/l | 10 UJ | | 10 UJ | | 10 U | 10 U |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | GW-80S | GW-82D | GW-82S | GW-83D | GW-83M | GW-83S |
|-----------------------------|----------|-------|---------------|---------------|---------------|---------------|---------------|---------------|
| Lab SDG Chromium | | | 480-150981-1 | 480-151289-1 | 480-151084-1 | 480-152464-1 | 480-152464-1 | 480-152464-1 |
| Lab SDG Hexavalent Chromium | | | 2036029 | 2037081 | 2036828 | 2041644 | 2041644 | 2041644 |
| Sample Date | | | 3/28/2019 | 4/3/2019 | 4/2/2019 | 5/1/2019 | 5/1/2019 | 5/1/2019 |
| Sample ID | | | OC-GW-80S-XXX | OC-GW-82D-XXX | OC-GW-82S-XXX | OC-GW-83D-XXX | OC-GW-83M-XXX | OC-GW-83S-XXX |
| QC Code | | | FS | FS | FS | FS | FS | FS |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| Chromium | T | ug/l | 9.4 | 5 U | 5 U | 25 U | 5 U | 5 U |
| Chromium, Hexavalent | T | ug/l | 10 UJ | 10 U | 10 U | 10 UJ | 10 UJ | 10 UJ |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | GW-84D | GW-84M | GW-84S | GW-84S | GW-85D | GW-85M |
|-----------------------------|----------|-------|---------------|---------------|---------------|---------------|---------------|---------------|
| Lab SDG Chromium | | | 480-152464-1 | 480-152464-1 | 480-152464-1 | 480-152464-1 | 480-152464-1 | 480-152464-1 |
| Lab SDG Hexavalent Chromium | | | 2041644 | 2041644 | 2041644 | 2041644 | 2041878 | 2041878 |
| Sample Date | | | 5/1/2019 | 5/1/2019 | 5/1/2019 | 5/1/2019 | 5/2/2019 | 5/2/2019 |
| Sample ID | | | OC-GW-84D-XXX | OC-GW-84M-XXX | OC-GW-84S-DUP | OC-GW-84S-XXX | OC-GW-85D-XXX | OC-GW-85M-XXX |
| QC Code | | | FS | FS | FD | FS | FS | FS |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| Chromium | T | ug/l | 5 U | | 5 U | | 5 U | |
| Chromium, Hexavalent | T | ug/l | 10 UJ | | 10 UJ | | 10 UJ | |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | GW-86D | GW-86M | GW-86S | GW-87D | GW-88D | GW-88M |
|-----------------------------|----------|-------|---------------|---------------|---------------|---------------|---------------|---------------|
| Lab SDG Chromium | | | 480-152464-1 | 480-152464-1 | 480-152464-1 | 480-152464-1 | 480-152464-1 | 480-152464-1 |
| Lab SDG Hexavalent Chromium | | | 2041242 | 2041242 | 2041242 | 2041242 | 2041447 | 2041447 |
| Sample Date | | | 4/29/2019 | 4/29/2019 | 4/29/2019 | 4/29/2019 | 4/30/2019 | 4/30/2019 |
| Sample ID | | | OC-GW-86D-XXX | OC-GW-86M-XXX | OC-GW-86S-XXX | OC-GW-87D-XXX | OC-GW-88D-XXX | OC-GW-88M-XXX |
| QC Code | | | FS | FS | FS | FS | FS | FS |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| Chromium | T | ug/l | 5 U | | 5 U | 13 | 5 U | 5 U |
| Chromium, Hexavalent | T | ug/l | 10 UJ | | 10 U | 10 UJ | 10 U | 10 U |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | MP-2 #01 | MP-2 #03 | MP-2 #04 | MP-2 #06 | MP-2 #07 | MP-2 #09 | | | | | | |
|-----------------------------|----------|-------|----------------|----------------|----------------|----------------|----------------|----------------|----|------|----|------|-----|------|
| Lab SDG Chromium | | | 480-150981-1 | 480-150981-1 | 480-150981-1 | 480-150981-1 | 480-150981-1 | 480-151289-1 | | | | | | |
| Lab SDG Hexavalent Chromium | | | 2036029 | 2036029 | 2035847 | 2035847 | 2035847 | 2037371 | | | | | | |
| Sample Date | | | 3/28/2019 | 3/28/2019 | 3/27/2019 | 3/27/2019 | 3/27/2019 | 4/4/2019 | | | | | | |
| Sample ID | | | OC-MP-2 #1-XXX | OC-MP-2 #3-XXX | OC-MP-2 #4-XXX | OC-MP-2 #6-XXX | OC-MP-2 #7-XXX | OC-MP-2 #9-XXX | | | | | | |
| QC Code | | | FS | FS | FS | FS | FS | FS | | | | | | |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier | | | | | | |
| Chromium | T | ug/l | 750,000 | | 3,300 | | 290 | | 57 | | 78 | | 320 | |
| Chromium, Hexavalent | T | ug/l | | 10 U | | 10 UJ | | 10 U | | 10 U | | 10 U | | 10 U |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | MP-2 #11 | MP-2 #15 | MP-3 #01 | MP-3 #02 | MP-3 #03 | MP-3 #04 |
|-----------------------------|----------|-------|-----------------|-----------------|---------------|---------------|---------------|----------------|
| Lab SDG Chromium | | | 480-150981-1 | 480-150981-1 | 480-151289-1 | 480-151289-1 | 480-151289-1 | 480-151289-1 |
| Lab SDG Hexavalent Chromium | | | 2035847 | 2035628 | 2037653 | 2037653 | 2037371 | 2037371 |
| Sample Date | | | 3/27/2019 | 3/26/2019 | 4/5/2019 | 4/5/2019 | 4/4/2019 | 4/4/2019 |
| Sample ID | | | OC-MP-2 #11-XXX | OC-MP-2 #15-XXX | OC-MP-3#1-XXX | OC-MP-3#2-XXX | OC-MP-3#3-XXX | OC-MP-3 #4-XXX |
| QC Code | | | FS | FS | FS | FS | FS | FS |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| Chromium | T | ug/l | 180 | | 37 | 529,000 | 410,000 | 40,900 |
| Chromium, Hexavalent | T | ug/l | 10 UJ | | 10 U | 10 UJ | 10 U | 10 U |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | MP-3 #05 | MP-3 #06 | MP-3 #07 | MP-3 #08 | MP-3 #09 | MP-3 #10 | | | | | |
|-----------------------------|----------|-------|----------------|----------------|----------------|----------------|----------------|-----------------|-------|--|-------|--|------|
| Lab SDG Chromium | | | 480-151289-1 | 480-151289-1 | 480-151289-1 | 480-151289-1 | 480-151289-1 | 480-151289-1 | | | | | |
| Lab SDG Hexavalent Chromium | | | 2037371 | 2037371 | 2037371 | 2037371 | 2037371 | 2037081 | | | | | |
| Sample Date | | | 4/4/2019 | 4/4/2019 | 4/4/2019 | 4/4/2019 | 4/4/2019 | 4/3/2019 | | | | | |
| Sample ID | | | OC-MP-3 #5-XXX | OC-MP-3 #6-XXX | OC-MP-3 #7-XXX | OC-MP-3 #8-XXX | OC-MP-3 #9-XXX | OC-MP-3 #10-XXX | | | | | |
| QC Code | | | FS | FS | FS | FS | FS | FS | | | | | |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier | | | | | |
| Chromium | T | ug/l | 51 | | 6.8 | | 3 J | | 5.9 | | 9.7 | | 110 |
| Chromium, Hexavalent | T | ug/l | 10 U | | 10 U | | 10 U | | 10 UJ | | 10 UJ | | 10 U |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | MP-3 #11 | MP-3 #12 | MP-3 #13 | MP-3 #14 | MP-3 #15 | MP-3 #16 | | | | | |
|-----------------------------|----------|-------|-----------------|-----------------|----------------|----------------|----------------|-----------------|-------|--|-------|--|------|
| Lab SDG Chromium | | | 480-151289-1 | 480-151289-1 | 480-151084-1 | 480-151084-1 | 480-151084-1 | 480-151084-1 | | | | | |
| Lab SDG Hexavalent Chromium | | | 2037081 | 2037081 | 2036828 | 2036828 | 2036828 | 2036580 | | | | | |
| Sample Date | | | 4/3/2019 | 4/3/2019 | 4/2/2019 | 4/2/2019 | 4/2/2019 | 4/1/2019 | | | | | |
| Sample ID | | | OC-MP-3 #11-XXX | OC-MP-3 #12-XXX | OC-MP-3#13-XXX | OC-MP-3#14-XXX | OC-MP-3#15-XXX | OC-MP-3 #16-XXX | | | | | |
| QC Code | | | FS | FS | FS | FS | FS | FS | | | | | |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier | | | | | |
| Chromium | T | ug/l | 4.5 J | | 4.5 J | | 5.1 J | | 4.6 J | | 3.5 J | | 5.8 |
| Chromium, Hexavalent | T | ug/l | 10 U | | 10 U | | 10 U | | 10 U | | 10 UJ | | 10 U |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | MP-3 #17 | MP-3 #17 | MP-3 #18 | MP-3 #19 | MP-3 #20 | MP-3 #21 |
|-----------------------------|----------|-------|-----------------|-----------------|----------------|----------------|----------------|-----------------|
| Lab SDG Chromium | | | 480-151084-1 | 480-151084-1 | 480-151084-1 | 480-151084-1 | 480-151084-1 | 480-150981-1 |
| Lab SDG Hexavalent Chromium | | | 2036580 | 2036580 | 2036334 | 2036334 | 2036029 | 2036029 |
| Sample Date | | | 4/1/2019 | 4/1/2019 | 3/29/2019 | 3/29/2019 | 3/28/2019 | 3/28/2019 |
| Sample ID | | | OC-MP-3 #17-DUP | OC-MP-3 #17-XXX | OC-MP-3#18-XXX | OC-MP-3#19-XXX | OC-MP-3#20-XXX | OC-MP-3 #21-XXX |
| QC Code | | | FD | FS | FS | FS | FS | FS |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| Chromium | T | ug/l | 6 | | 6.7 | J | 6.6 | 24 |
| Chromium, Hexavalent | T | ug/l | 10 U | | 10 U | J | 10 U | 10 U |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | MP-4 #02 | MP-4 #03 | MP-4 #05 | MP-4 #10 | MP-4 #11 | MP-4 #12 |
|-----------------------------|----------|-------|---------------|----------------|----------------|----------------|----------------|----------------|
| Lab SDG Chromium | | | 480-151084-1 | 480-151084-1 | 480-151084-1 | 480-151084-1 | 480-151084-1 | 480-151084-1 |
| Lab SDG Hexavalent Chromium | | | 2036580 | 2036580 | 2036580 | 2036828 | 2036029 | 2036334 |
| Sample Date | | | 4/1/2019 | 4/1/2019 | 4/1/2019 | 4/2/2019 | 3/28/2019 | 3/29/2019 |
| Sample ID | | | OC-MP-4#2-XXX | OC-MP-4 #3-XXX | OC-MP-4 #5-XXX | OC-MP-4#10-XXX | OC-MP-4#11-XXX | OC-MP-4#12-XXX |
| QC Code | | | FS | FS | FS | FS | FS | FS |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| Chromium | T | ug/l | 12 J | | 9.6 | 1,500 J | 2,500 J | 2 J |
| Chromium, Hexavalent | T | ug/l | 10 U | | 10 U | 10 UJ | 10 U | 10 UJ |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | MP-4 #13 | MP-4 #14 | MP-5 #03 | MP-5 #06 | MP-5 #08 | MP-5 #11 |
|-----------------------------|----------|-------|----------------|-----------------|----------------|----------------|----------------|-----------------|
| Lab SDG Chromium | | | 480-151084-1 | 480-150981-1 | 480-152464-1 | 480-152464-1 | 480-152464-1 | 480-152464-1 |
| Lab SDG Hexavalent Chromium | | | 2036334 | 2036029 | 2041878 | 2041878 | 2041447 | 2041447 |
| Sample Date | | | 3/29/2019 | 3/28/2019 | 5/2/2019 | 5/2/2019 | 4/30/2019 | 4/30/2019 |
| Sample ID | | | OC-MP-4#13-XXX | OC-MP-4 #14-XXX | OC-MP-5 #3-XXX | OC-MP-5 #6-XXX | OC-MP-5 #8-XXX | OC-MP-5 #11-XXX |
| QC Code | | | FS | FS | FS | FS | FS | FS |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| Chromium | T | ug/l | 5 U | | 5 U | | 40 | 5 U |
| Chromium, Hexavalent | T | ug/l | 10 UJ | | 10 U | | 10 U | 10 U |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

**Table 2 - Final Results Summary - Chromium
Data Validation Report**
Spring 2019 Comprehensive Groundwater Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | | | MP-5 #12 | MP-5 #15 | MW-204BR | MW-204D | MW-204M | MW-204S |
|-----------------------------|----------|-------|-----------------|-----------------|-----------------|----------------|----------------|----------------|
| Lab SDG Chromium | | | 480-152464-1 | 480-152464-1 | 480-152464-1 | 480-152464-1 | 480-152464-1 | 480-152464-1 |
| Lab SDG Hexavalent Chromium | | | 2041447 | 2041447 | 2040507 | 2040507 | 2040507 | 2040507 |
| Sample Date | | | 4/30/2019 | 4/30/2019 | 4/24/2019 | 4/24/2019 | 4/24/2019 | 4/24/2019 |
| Sample ID | | | OC-MP-5 #12-XXX | OC-MP-5 #15-XXX | OC-MW-204BR-XXX | OC-MW-204D-XXX | OC-MW-204M-XXX | OC-MW-204S-XXX |
| QC Code | | | FS | FS | FS | FS | FS | FS |
| Parameter | Fraction | Units | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| Chromium | T | ug/l | 5 U | | 5 U | | 5 U | |
| Chromium, Hexavalent | T | ug/l | 10 U | | 10 U | | 10 UJ | |

Notes:

FS = Field Sample

FD = Field Duplicate

U = Not detected, value is the reporting limit

J = Value is estimated

ug/l = micrograms per liter

T = Total

Table 3 - Surface Water Data
East Ditch and South Ditch
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Area | Location | Sample Date | Sample ID | Parameter Units | Chromium ug/L | | Chromium, Hexavalent ug/L | |
|-------------|-------------------|-------------|----------------------------------|--------------------|------------------|--------|------------------------------|--------|
| | | | | | Qc Code | Result | Qual | Result |
| East Ditch | EDSD/SW0 | 4/29/2004 | EDSW0-01 | FS | | 5 U | | 5 UJ |
| East Ditch | EDSD/SW1 (EDBS5) | 6/19/2003 | EDSW1-01 | FS | | 5 U | | 5 U |
| East Ditch | EDSD/SW1 (EDBS5) | 9/23/2003 | EDSW1-02 | FS | | 15 U | | 5 UJ |
| East Ditch | EDSD/SW1 (EDBS5) | 4/29/2004 | EDSW1-03 | FS | | 5 U | | 5 UJ |
| East Ditch | EDSD/SW2 (EDBS6) | 6/19/2003 | EDSW2-01 | FS | | 5 U | | 5 U |
| East Ditch | EDSD/SW2 (EDBS6) | 9/23/2003 | EDSW2-02 | FS | | 75 U | | 5 UJ |
| East Ditch | EDSD/SW2 (EDBS6) | 4/29/2004 | EDSW2-03 | FS | | 5 U | | 5 UJ |
| East Ditch | EDSD/SW2 (EDBS6) | 12/13/2010 | OC-SW-EDSD/SW2 (EDBS6)-XXX | FS | | 5 U | | 1 UJ |
| East Ditch | EDSD/SW2 (EDBS6) | 6/8/2011 | OC-SW-EDSD/SW2(EDBS6)-XXX | FS | | 5 U | | 0.56 J |
| East Ditch | EDSD/SW5 (EDBS11) | 6/19/2003 | EDSW5-01 | FS | | 17 U | | 5 U |
| East Ditch | EDSD/SW5 (EDBS11) | 9/23/2003 | EDSW5-02 | FS | | 31 U | | 5 U |
| East Ditch | EDSD/SW5 (EDBS11) | 4/28/2004 | EDSW5-03 | FS | | 33 U | | 5 UJ |
| East Ditch | EDSD/SW5 (EDBS11) | 12/13/2010 | OC-SW-EDSD/SW5 (EDBS11)-XXX | FS | | 65 | | 0.86 J |
| East Ditch | EDSD/SW5 (EDBS11) | 6/8/2011 | OC-SW-EDSD/SW5(EDBS11)-XXX | FS | | 4 J | | 1 UJ |
| East Ditch | EDSD/SW7 | 4/28/2004 | EDSW7-01 | FS | | 11 U | | 5 UJ |
| East Ditch | EDSD/SW7 | 10/5/2004 | EDSW7-02 | FS | | 5 U | | 5 U |
| East Ditch | EDSD/SW7 | 2/15/2005 | EDSW7-03 | FS | | 23 U | | 5 U |
| South Ditch | ISCO1 | 6/6/2011 | OC-SW-ISCO-1-DUPOC-SW-ISCO-1-XXX | FD | | 12 | | 1 UJ |
| South Ditch | ISCO1 | 6/6/2011 | OC-SW-ISCO-1-RISK | RS | | 12 | | 1 UJ |
| South Ditch | ISCO1 | 6/6/2011 | OC-SW-ISCO-1-XXX | FS | | 12 | | 1 U |
| South Ditch | ISCO2 | 6/6/2011 | OC-SW-ISCO-2-XXX | FS | | 1,100 | | 1 UJ |
| South Ditch | PZ-17RR | 12/17/2012 | OC-SW-PZ-17RR-XXX | FS | | 710 | | 5 U |
| South Ditch | SD-1 | 12/17/2012 | OC-SW-SD-1-XXX | FS | | 290 | | 5 U |

Notes:

FS = Field Sample

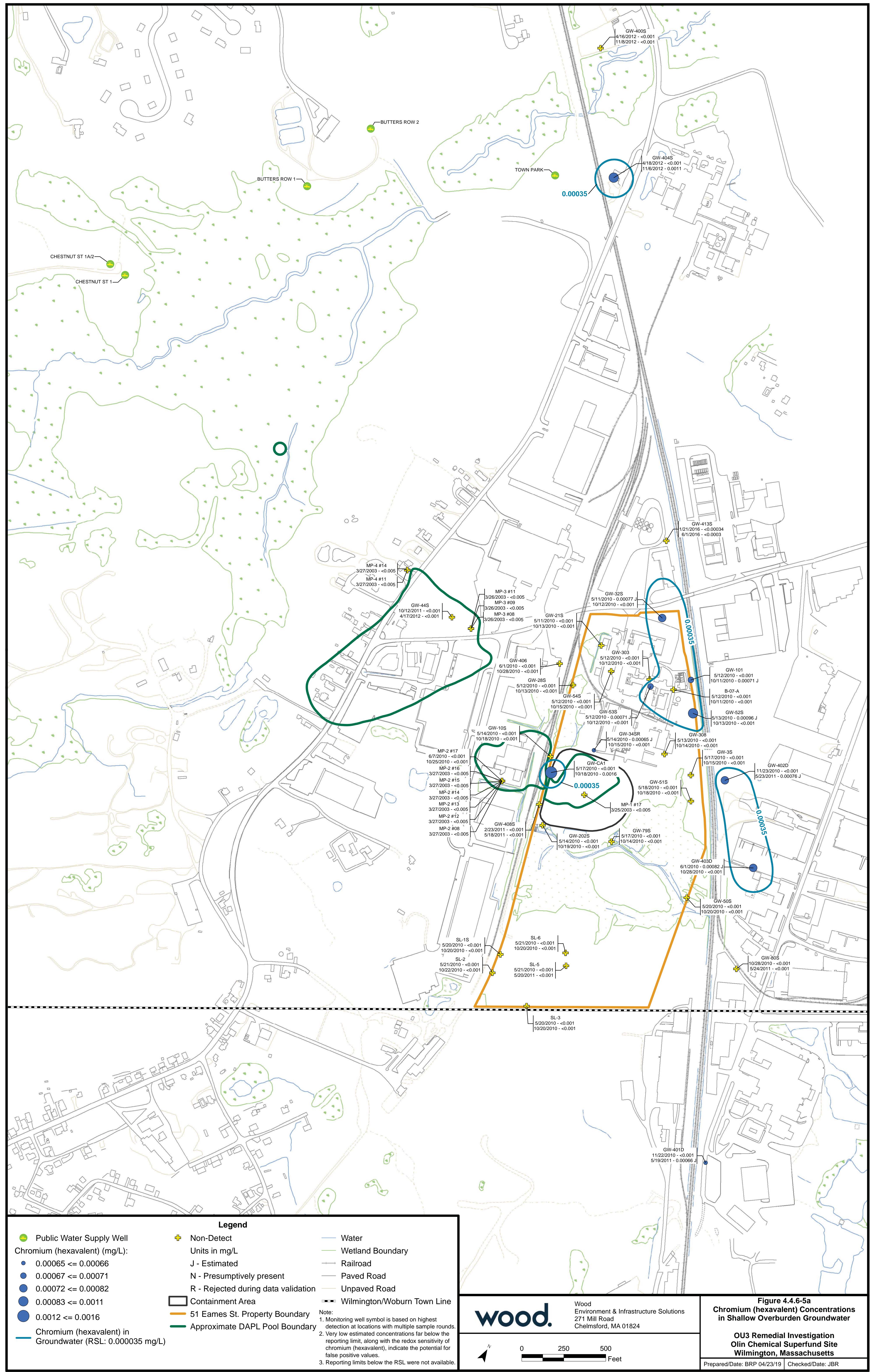
FD = Field Duplicate

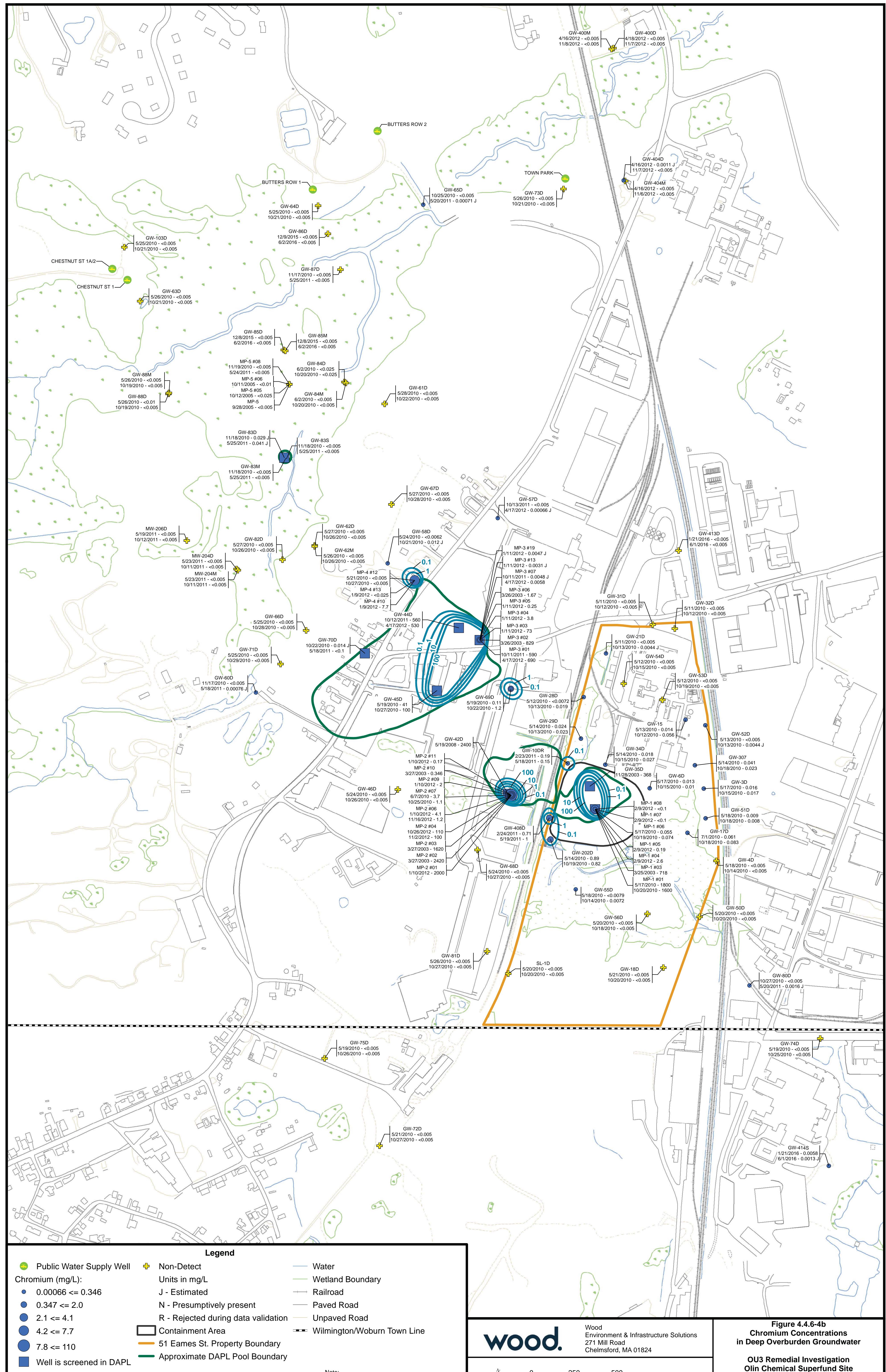
U = Not detected, value is the reporting limit

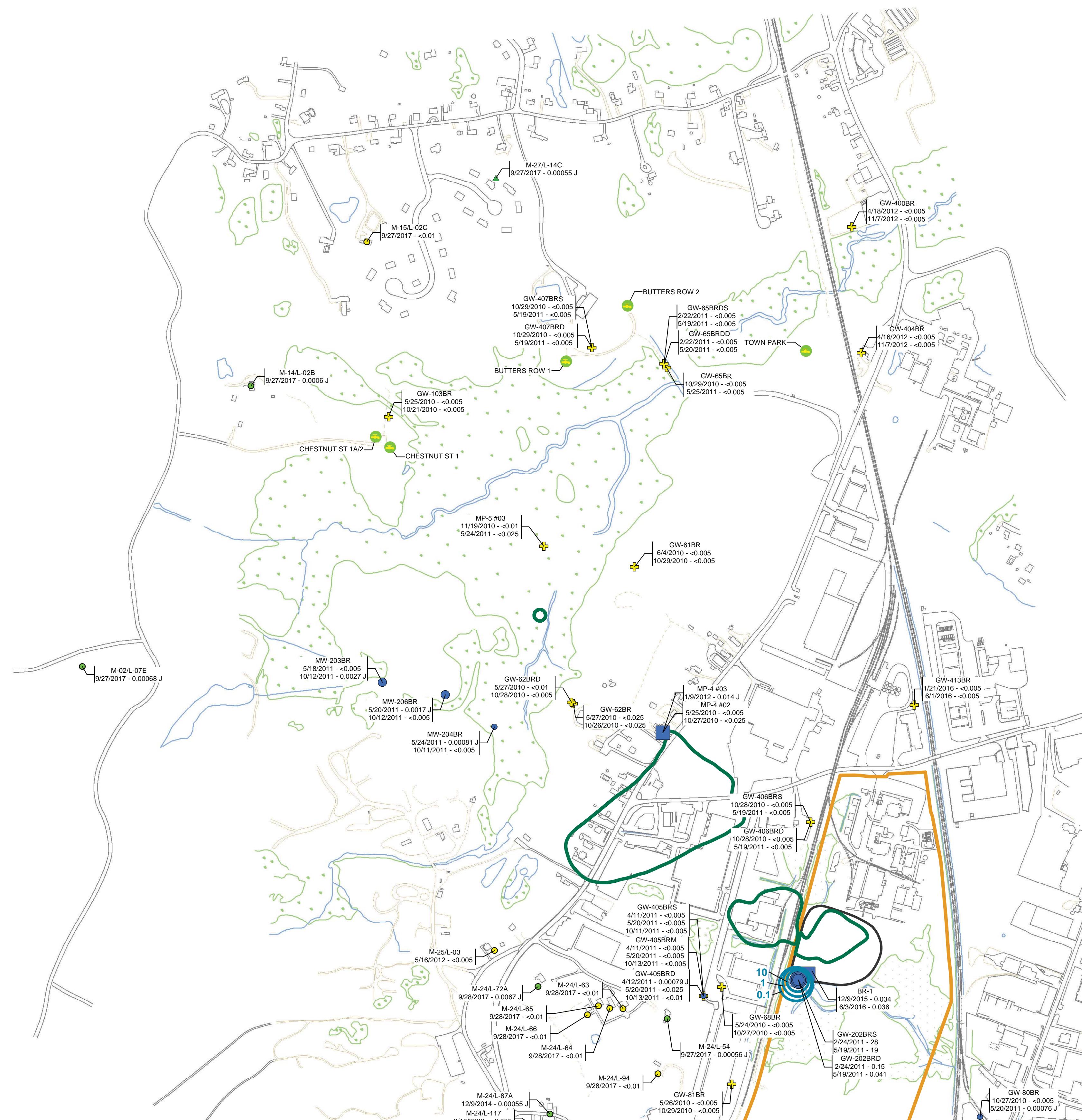
J = Value is estimated

ug/L = micrograms per liter

ATTACHMENT A
HEXAVALENT CHROMIUM FIGURES
SHALLOW AND DEEP OVERBURDEN AND BEDROCK
FROM JUNE 2019 OU3 REMEDIAL INVESTIGATION REPORT







Legend

| | | |
|---|--------------------------------------|-------------------------------|
| ● Public Water Supply Well | ✚ Non-Detect | — Water |
| ▲ Private Irrigation Well | ▲ Private Irrigation Well Non-Detect | — Wetland Boundary |
| ● Residential Well | ○ Residential Well Non-Detect | — Railroad |
| Chromium (mg/L): | | — Paved Road |
| ● 0.00076 <= 0.0011 | | — Unpaved Road |
| ● 0.0012 <= 0.0027 | | — Wilmington/Woburn Town Line |
| ● 0.0028 <= 0.041 | | |
| ● 0.042 <= 0.15 | | |
| ● 0.16 <= 28 | | |
| ■ Well is screened in DAPL | | |
| Chromium in Groundwater (MCL: 0.1 mg/L) | | |
| — Containment Area | | |
| — 51 Eames St. Property Boundary | | |
| — Approximate DAPL Pool Boundary | | |

Notes:
1. Monitoring well symbol is based on highest detection at locations with multiple sample rounds.
2. Posted residential well data includes the date and highest sample result.

WOOD.

Wood
Environment & Infrastructure Solutions
271 Mill Road
Chelmsford, MA 01824

Figure 4.4.6-4c
Chromium Concentrations in Bedrock Groundwater

OU3 Remedial Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BRP 04/24/19 | Checked/Date: JBR

ATTACHMENT B
HEXAVALENT CHROMIUM DATA AND FIGURE
SURFACE WATER
FROM JULY 2015 OU1 AND OU2 REMEDIAL INVESTIGATION REPORT

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | | Average of All Samples | AWQC (1) (mg/L) | OC-SW-ISCO1 11/15/2010 | OC-SW-ISCO1 1-XXX ISCO1 12/10/2010 | OC-SW-ISCO1 1-XXX ISCO1 3/22/2011 | OC-SW-ISCO1 1-XXX ISCO1 5/16/2011 | OC-SW-ISCO1 1-XXX ISCO1 6/6/2011 | OC-SW-ISCO1 1-XXX ISCO1 8/23/2011 | OC-SW-ISCO1 1-XXX ISCO1 11/8/2011 | | |
|-------------------------------------|------------------------|---|---|----------------------------------|-----------|------------------------|-----------------|---------------------------|---|--|--|---|--|--|-------|------|
| Volatile Organics (mg/L) | | | | | | | | | | | | | | | | |
| 1,3-Dichlorobenzene | 2 / 12 | 0.001 | : | 0.001 | 0.0003 | - | 0.00057 | 0.000489167 | 0.96 | | 0.001 U | | | 0.001 U | | |
| 2,4,4-Trimethyl-1-pentene | 9 / 12 | 0.001 | : | 0.001 | 0.0014 | - | 0.01 | 0.003275 | | | 0.001 U | | | 0.001 UJ | | |
| 2,4,4-Trimethyl-2-pentene | 5 / 12 | 0.001 | : | 0.001 | 0.00044 | - | 0.002 | 0.000690833 | | | 0.001 U | | | 0.001 U | | |
| 2-Butanone | 2 / 12 | 0.01 | : | 0.01 | 0.0071 | - | 0.025 | 0.006841667 | | | 0.01 U | | | 0.01 U | | |
| Acetone | 2 / 12 | 0.05 | : | 0.05 | 0.0084 | - | 0.012 | 0.022533333 | | | 0.05 U | | | 0.05 U | | |
| Bromodichloromethane | 3 / 12 | 0.0005 | : | 0.001 | 0.00021 | - | 0.00051 | 0.000360833 | 0.017 | | 0.001 U | | | 0.0005 U | | |
| Bromoform | 8 / 12 | 0.001 | : | 0.001 | 0.00067 | - | 0.0034 | 0.0012825 | 0.14 | | 0.001 UJ | | | 0.001 UJ | | |
| Carbon disulfide | 3 / 12 | 0.01 | : | 0.01 | 0.00021 | - | 0.00067 | 0.003871667 | | | 0.00067 J | | | 0.00021 J | | |
| Chlorodibromomethane | 6 / 12 | 0.0005 | : | 0.0005 | 0.00048 | - | 0.0038 | 0.001431667 | 0.013 | | 0.0005 U | | | 0.0005 U | | |
| Chloroform | 6 / 12 | 0.001 | : | 0.001 | 0.00027 | - | 0.0012 | 0.0005675 | 0.47 | | 0.001 U | | | 0.001 U | | |
| Dibromomethane | 6 / 12 | 0.001 | : | 0.001 | 0.00032 | - | 0.0011 | 0.000576667 | | | 0.001 U | | | 0.001 U | | |
| Toluene | 2 / 12 | 0.001 | : | 0.001 | 0.00046 | - | 0.00048 | 0.000495 | 15 | | 0.001 U | | | 0.001 U | | |
| Semivolatile Organics (mg/L) | | | | | | | | | | | | | | | | |
| 2-Nitrophenol | 7 / 12 | 0.00096 | : | 0.0045 | 0.00057 | - | 0.0018 | 0.001224583 | | | 0.0045 U | | | 0.0045 U | | |
| 4-Nitrophenol | 4 / 12 | 0.0045 | : | 0.005 | 0.00072 | - | 0.0021 | 0.0020725 | | | 0.0045 UJ | | | 0.0045 U | | |
| Azobenzene | 2 / 12 | 0.00096 | : | 0.005 | 0.00046 | - | 0.00053 | 0.001684583 | | | 0.0045 U | | | 0.0045 U | | |
| Benzo(a)pyrene | 1 / 12 | 0.00018 | : | 0.00099 | 0.00015 | - | 0.00015 | 0.000162083 | 0.000018 | | 0.00018 U | | | 0.00018 U | | |
| Benzoic Acid | 7 / 10 | 0.0045 | : | 0.0045 | 0.0018 | - | 0.0021 | 0.002045 | | | 0.0019 J | | | 0.0019 J | | |
| Bis(2-Ethylhexyl)phthalate | 2 / 11 | 0.0018 | : | 0.0089 | 0.0018 | - | 0.0061 | 0.002440909 | 0.0022 | | R | | | 0.0018 U | | |
| Diphenyl ether | 4 / 12 | 0.00096 | : | 0.005 | 0.00056 | - | 0.0011 | 0.001480417 | | | 0.0045 U | | | 0.0045 U | | |
| Diphenylmethanone | 4 / 12 | 0.00096 | : | 0.005 | 0.00052 | - | 0.0012 | 0.001509583 | | | 0.0045 U | | | 0.0045 U | | |
| N-Nitrosodimethylamine | 12 / 12 | | | | 0.000023 | - | 0.0003 | 0.000122417 | 0.003 | | 0.000061 | | | 0.000023 | | |
| N-Nitrosodi-n-propylamine | 2 / 12 | 1.9E-06 | : | 0.000021 | 0.0000049 | - | 0.0000093 | 3.50833E-06 | 0.00051 | | 0.0000019 U | | | 0.0000019 U | | |
| N-Nitrosodiphenylamine | 2 / 12 | 0.00096 | : | 0.005 | 0.00047 | - | 0.00064 | 0.001694583 | 0.006 | | 0.0045 U | | | 0.0045 U | | |
| Metals, Total (mg/L) | | | | | | | | | | | | | | | | |
| Aluminum | 89 / 90 | 0.2 | : | 0.2 | 0.076 | - | 26 | 1.999266667 | | 0.3 | 0.25 | 0.26 | 0.18 | 0.1 | 0.15 | 0.33 |
| Antimony | 1 / 12 | 0.006 | : | 0.006 | 0.0037 | - | 0.0037 | 0.003058333 | 0.64 | | 0.0037 J | | | 0.006 U | | |
| Arsenic | 2 / 12 | 0.01 | : | 0.01 | 0.0031 | - | 0.0035 | 0.004716667 | 0.00014 | | 0.01 U | | | 0.01 U | | |
| Barium | 12 / 12 | | | | 0.013 | - | 0.032 | 0.02425 | | | 0.032 | | | 0.028 | | |
| Beryllium | 5 / 12 | 0.001 | : | 0.001 | 0.0003 | - | 0.0011 | 0.000608333 | | | 0.001 U | | | 0.001 U | | |
| Calcium | 12 / 12 | | | | 23 | - | 81 | 53.16666667 | | | 27 | | | 25 | | |
| Chromium | 90 / 90 | | | | 0.0085 | - | 5.7 | 0.442966667 | | 0.027 | 0.029 | 0.016 | 0.012 | 0.012 | 0.016 | 0.03 |
| Cobalt | 12 / 12 | | | | 0.0054 | - | 0.05 | 0.028583333 | | | 0.014 | | | 0.0054 J | | |
| Copper | 12 / 12 | | | | 0.00021 | - | 0.026 | 0.008583333 | | | 0.0043 J | | | 0.00049 J | | |
| Iron | 12 / 12 | | | | 1.5 | - | 13 | 5.958333333 | | | 8 | | | 4.7 | | |
| Lead | 10 / 12 | 0.0001 | : | 0.001 | 0.0003 | - | 0.0021 | 0.000605 | | | 0.00045 J | | | 0.00032 J | | |
| Magnesium | 12 / 12 | | | | 3.3 | - | 17 | 10.925 | | | 4.4 | | | 4.4 | | |

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | Frequency of Detection | Range of Reporting Limits for Non Detects | Range of Detected Concentrations | Average of All Samples | AWQC (1) (mg/L) | OC-SW-ISCO1 ISCO1 11/15/2010 | OC-SW-ISCO1 ISCO1 12/10/2010 | OC-SW-ISCO1 ISCO1 3/22/2011 | OC-SW-ISCO1 ISCO1 5/16/2011 | OC-SW-ISCO1 ISCO1 6/6/2011 | OC-SW-ISCO1 ISCO1 8/23/2011 | OC-SW-ISCO1 ISCO1 11/8/2011 |
|-----------------------------------|------------------------|---|----------------------------------|------------------------|-----------------|------------------------------|------------------------------|-----------------------------|-----------------------------|----------------------------|-----------------------------|-----------------------------|
| Manganese | 12 / 12 | | 0.5 - 2.2 | 1.496666667 | 0.1 | | | 1.1 | | | 0.81 | |
| Mercury | 1 / 12 | 0.0002 : 0.0002 | 0.00029 - 0.00029 | 0.000115833 | | | 0.0002 U | | | | 0.0002 U | |
| Nickel | 12 / 12 | | 0.0042 - 0.057 | 0.030933333 | 4.6 | | | 0.012 | | | 0.0042 J | |
| Potassium | 12 / 12 | | 1.3 - 3.4 | 2.291666667 | | | | 1.5 J | | | 2.2 J | |
| Silver | 1 / 12 | 0.0001 : 0.001 | 0.000017 - 0.000017 | 0.00027225 | | | 0.001 UJ | | | | 0.0001 U | |
| Sodium | 90 / 90 | | 52 - 320 | 127.377778 | | 79 J | 96 | 88 | 63 | 98 | 73 J | 89 |
| Thallium | 1 / 12 | 0.01 : 0.01 | 0.0031 - 0.0031 | 0.004841667 | 0.00047 | | 0.0031 J | | | 0.01 U | | |
| Vanadium | 1 / 12 | 0.01 : 0.01 | 0.0022 - 0.0022 | 0.004766667 | | | 0.01 UJ | | | 0.01 U | | |
| Zinc | 12 / 12 | | 0.02 - 0.097 | 0.056 | 26 | | | 0.02 J | | | 0.021 J | |
| Metals, Filtered (mg/L) | | | | | | | | | | | | |
| Aluminum | 75 / 78 | 0.2 : 0.2 | 0.036 - 22 | 0.833564103 | | 0.19 | | 0.17 | 0.074 J | | 0.04 J | 0.15 |
| Chromium | 78 / 78 | | 0.0049 - 5 | 0.237105128 | | 0.019 | | 0.013 | 0.0058 | | 0.0086 | 0.013 |
| Sodium | 78 / 78 | | 63 - 330 | 132.2435897 | | 87 J | | 94 | 74 | | 90 J | 98 |
| Inorganics (mg/L) | | | | | | | | | | | | |
| Bromide | 10 / 12 | 0.2 : 0.2 | 0.14 - 0.48 | 0.315833333 | | | 0.17 | | | | 0.14 | |
| Chloride | 90 / 90 | | 64 - 320 | 161.522222 | | 130 | 150 | 140 | 110 J | 130 | 110 | 120 |
| Hardness | 12 / 12 | | 80 - 270 | 177.0833333 | | | 85 | | | | 80 | |
| Lab Specific Conductance (mS/cm) | 78 / 78 | | 0.6 - 3.7 | 1.297820513 | | 0.87 | | 0.7 | 0.63 | | 0.79 | 0.76 |
| Nitrate as N | 89 / 90 | 0.05 : 0.05 | 0.078 - 6 | 0.8737 | | 0.38 | 0.11 | 0.36 | 0.14 J | 0.05 U | 0.08 | 0.2 |
| Nitrite as N | 12 / 84 | 0.01 : 0.1 | 0.01 - 0.043 | 0.031464286 | | 0.01 U | 0.01 U | 0.1 U | 0.01 UJ | 0.01 U | 0.1 U | 0.01 U |
| Nitrogen, as Ammonia | 90 / 90 | | 14 - 180 | 56.44444444 | * | 38 | 40 | 14 | 18 J | 31 J | 37 | 25 |
| Sulfate | 90 / 90 | | 63 - 1300 | 357.1666667 | | 220 | 240 | 68 | 89 J | 150 | 130 | 110 |
| Total Organic Carbon | 12 / 12 | | 4.5 - 24 | 11.40833333 | | | | 7.6 | | | 6.1 | |
| Total Suspended Solids | 12 / 12 | | 2 - 240 | 40.48333333 | | | | 18 | | | 6 J | |
| Specialty Compounds (mg/L) | | | | | | | | | | | | |
| Hydrazine | 2 / 10 | 0.0001 : 0.0001 | 0.000076 - 0.00008 | 0.0000556 | | | 0.0001 U | | | | 0.0001 U | |
| Formaldehyde | 5 / 10 | 0.03 : 0.03 | 0.015 - 0.021 | 0.0164 | | | 0.015 J | | | | 0.03 U | |
| 4,4'-Isopropylidenediphenol | 3 / 9 | 0.00094 : 0.00098 | 0.00065 - 0.00096 | 0.000593333 | | | 0.00094 U | | | | 0.00095 U | |
| 4-Nonylphenol (Tech.) | 7 / 9 | 0.0047 : 0.0048 | 0.0056 - 0.018 | 0.009805556 | 0.0066 | | 0.0047 U | | | | 0.0048 U | |
| Kempore (Azodicarbonamide) | 3 / 10 | 1 : 1.1 | 1.1 - 1.4 | 0.725 | | | 1 U | | | | 1 U | |

(1) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.

mg/L = milligram per liter

mS/cm = millisiemens per centimeter

U = not detected,

value is the reporting limit

J = value is estimated

R = value is rejected

N = presumptively present

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | OC-ISCO1-SW ISCO1 2/23/2012 | OC-SW-ISCO1 ISCO1 6/7/2012 | OC-SW-ISCO1 ISCO1 8/23/2012 | OC-SW-ISCO1 ISCO1 11/16/2012 | OC-ISCO1 ISCO1 3/21/2013 | OC-ISCO1 ISCO1 5/13/2013 | OC-ISCO1 ISCO1 8/22/2013 | OC-ISCO1 ISCO1 11/21/2013 | OC-SW-ISCO2 ISCO2 11/15/2010 | OC-SW-ISCO2-XXX ISCO2 12/9/2010 | OC-SW-ISCO2 ISCO2 3/22/2011 | OC-SW-ISCO2 ISCO2 5/16/2011 | OC-SW-ISCO2-XXX ISCO2 6/6/2011 | OC-SW-ISCO2 ISCO2 8/23/2011 | OC-SW-ISCO2 ISCO2 11/8/2011 |
|-------------------------------------|-----------------------------------|----------------------------------|-----------------------------------|------------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|------------------------------------|---------------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|-----------------------------------|-----------------------------------|
| Volatile Organics (mg/L) | | | | | | | | | | | | | | | |
| 1,3-Dichlorobenzene | | | | | | | | | | 0.001 U | | | 0.001 U | | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | | | 0.0024 | | | 0.0019 J | | |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | | | 0.001 U | | | 0.00045 J | | |
| 2-Butanone | | | | | | | | | | 0.01 U | | | 0.01 U | | |
| Acetone | | | | | | | | | | 0.05 U | | | 0.05 U | | |
| Bromodichloromethane | | | | | | | | | | 0.001 U | | | 0.0005 U | | |
| Bromoform | | | | | | | | | | 0.001 J | | | 0.00067 J | | |
| Carbon disulfide | | | | | | | | | | 0.01 U | | | 0.01 U | | |
| Chlorodibromomethane | | | | | | | | | | 0.0034 | | | 0.0005 U | | |
| Chloroform | | | | | | | | | | 0.00027 J | | | 0.001 U | | |
| Dibromomethane | | | | | | | | | | 0.00032 J | | | 0.001 U | | |
| Toluene | | | | | | | | | | 0.001 U | | | 0.001 U | | |
| Semivolatile Organics (mg/L) | | | | | | | | | | | | | | | |
| 2-Nitrophenol | | | | | | | | | | 0.00057 J | | | 0.00091 J | | |
| 4-Nitrophenol | | | | | | | | | | 0.0045 UJ | | | 0.0045 U | | |
| Azobenzene | | | | | | | | | | 0.0045 U | | | 0.0045 U | | |
| Benzo(a)pyrene | | | | | | | | | | 0.00018 U | | | 0.00015 J | | |
| Benzoic Acid | | | | | | | | | | 0.0045 UJ | | | 0.0019 J | | |
| Bis(2-Ethylhexyl)phthalate | | | | | | | | | | 0.0065 U | | | 0.0061 | | |
| Diphenyl ether | | | | | | | | | | 0.0045 U | | | 0.0045 U | | |
| Diphenylmethanone | | | | | | | | | | 0.0045 U | | | 0.00067 J | | |
| N-Nitrosodimethylamine | | | | | | | | | | 0.00012 | | | 0.000078 | | |
| N-Nitrosodi-n-propylamine | | | | | | | | | | 0.000002 U | | | 0.000002 U | | |
| N-Nitrosodiphenylamine | | | | | | | | | | 0.0045 U | | | 0.0045 U | | |
| Metals, Total (mg/L) | | | | | | | | | | | | | | | |
| Aluminum | 0.085 J | 0.088 J | 0.08 J | 0.2 | 0.17 J | 0.15 J | 0.076 J | 0.12 J | 0.51 | 0.6 J | 1.7 | 0.6 | 5.4 | 0.23 | |
| Antimony | | | | | | | | | | 0.006 U | | | 0.006 U | | |
| Arsenic | | | | | | | | | | 0.0031 J | | | 0.01 U | | |
| Barium | | | | | | | | | | 0.025 | | | 0.027 | | |
| Beryllium | | | | | | | | | | 0.001 U | | | 0.00074 J | | |
| Calcium | | | | | | | | | | 56 J | | | 67 | | |
| Chromium | 0.015 | 0.0096 | 0.013 | 0.019 | 0.013 | 0.011 | 0.0089 B | 0.012 | 0.047 | 0.11 J | 0.26 | 0.065 | 1.1 | 0.051 | |
| Cobalt | | | | | | | | | | 0.025 | | | 0.032 | | |
| Copper | | | | | | | | | | 0.0042 J | | | 0.0078 | | |
| Iron | | | | | | | | | | 2.4 J | | | 13 | | |
| Lead | | | | | | | | | | 0.001 U | | | 0.0021 | | |
| Magnesium | | | | | | | | | | 9.9 | | | 14 | | |

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | OC-ISCO1-SW ISCO1 2/23/2012 | OC-SW-ISCO1 ISCO1 6/7/2012 | OC-SW-ISCO1 ISCO1 8/23/2012 | OC-SW-ISCO1 ISCO1 11/16/2012 | OC-ISCO1 ISCO1 3/21/2013 | OC-ISCO1 ISCO1 5/13/2013 | OC-ISCO1 ISCO1 8/22/2013 | OC-ISCO1 ISCO1 11/21/2013 | OC-SW-ISCO2 ISCO2 11/15/2010 | OC-SW-ISCO-2-XXX ISCO2 12/9/2010 | OC-SW-ISCO2 ISCO2 3/22/2011 | OC-SW-ISCO2 ISCO2 5/16/2011 | OC-SW-ISCO-2-XXX ISCO2 6/6/2011 | OC-SW-ISCO2 ISCO2 8/23/2011 | OC-SW-ISCO2 ISCO2 11/8/2011 |
|-----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|------------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|------------------------------------|--|-----------------------------------|-----------------------------------|---------------------------------------|-----------------------------------|-----------------------------------|
| Manganese | | | | | | | | | | 1.4 | | | | 1.7 | |
| Mercury | | | | | | | | | | 0.0002 U | | | 0.0002 U | | |
| Nickel | | | | | | | | | | 0.026 | | | 0.034 | | |
| Potassium | | | | | | | | | | 2.2 J | | | 2.2 J | | |
| Silver | | | | | | | | | | 0.001 UJ | | | 0.0001 U | | |
| Sodium | 100 J | 58 J | 69 | 76 | 120 | 98 | 110 | 64 | 120 | 120 J | 73 | 56 | 170 | 150 J | 84 J |
| Thallium | | | | | | | | | | 0.01 U | | | 0.01 U | | |
| Vanadium | | | | | | | | | | 0.01 U | | | 0.01 U | | |
| Zinc | | | | | | | | | | 0.057 | | | 0.059 | | |
| Metals, Filtered (mg/L) | | | | | | | | | | | | | | | |
| Aluminum | 0.1 J | 0.1 | 0.043 J | 0.17 J | 0.16 J | 0.063 J | 0.2 U | 0.069 J | 0.29 | | 0.36 | 0.15 | | 0.036 J | 0.13 |
| Chromium | 0.015 | 0.011 | 0.0096 | 0.017 | 0.011 | 0.0062 | 0.0061 | 0.0073 | 0.027 | | 0.049 | 0.016 | | 0.013 | 0.027 |
| Sodium | 120 J | 64 | 69 | 81 | 130 | 97 | 100 | 66 | 120 | | 76 | 66 | | 190 J | 100 J |
| Inorganics (mg/L) | | | | | | | | | | | | | | | |
| Bromide | | | | | | | | | | 0.33 | | | 0.43 | | |
| Chloride | 140 | 100 | 120 | 110 | 190 | 150 | 180 | 110 | 140 | 190 | 90 | 70 J | 180 | 170 | 97 |
| Hardness | | | | | | | | | | 180 J | | | 220 | | |
| Lab Specific Conductance (mS/cm) | 0.97 | 0.64 | 0.68 | 0.72 | 0.87 | 0.82 | 1 | 0.6 | 1.4 | | 0.72 | 0.74 | | 2.2 | 0.86 |
| Nitrate as N | 0.27 | 0.27 | 0.12 | 0.34 J | 0.49 | 0.21 | 0.4 | 0.16 | 2.8 | 2.8 | 1 | 0.57 J | 0.57 | 0.79 | 1.1 |
| Nitrite as N | 0.1 U | 0.1 U | 0.1 U | R | 0.05 U | 0.021 J | 0.05 U | 0.05 U | 0.017 | 0.1 U | 0.1 U | 0.01 UJ | 0.1 U | 0.1 U | 0.01 U |
| Nitrogen, as Ammonia | 44 | 23 | 29 | 23 | 14 | 28 | 31 | 20 | 61 | 74 | 19 | 28 J | 110 | 98 | 33 |
| Sulfate | 170 | 98 | 120 | 110 | 63 | 110 | 130 | 74 | 470 | 560 | 130 | 190 J | 800 | 580 | 180 |
| Total Organic Carbon | | | | | | | | | | 9.7 | | | 9.4 | | |
| Total Suspended Solids | | | | | | | | | | 2 | | | 240 J | | |
| Specialty Compounds (mg/L) | | | | | | | | | | | | | | | |
| Hydrazine | | | | | | | | | | 0.0001 U | | | 0.00008 J | | |
| Formaldehyde | | | | | | | | | | 0.019 J | | | 0.03 U | | |
| 4,4'-Isopropylidenediphenol | | | | | | | | | | 0.00094 U | | | 0.00065 J | | |
| 4-Nonylphenol (Tech.) | | | | | | | | | | 0.0062 | | | 0.0056 | | |
| Kempore (Azodicarbonamide) | | | | | | | | | | 1 U | | | 1.2 N | | |

(1) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.

mg/L = milligram per liter

mS/cm = millisiemen per centimeter

U = not detected,

value is the reporting limit

J = value is estimated

R = value is rejected

N = presumptively present

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | OC-ISCO2-SW ISCO2 2/23/2012 | OC-SW-ISCO2 ISCO2 6/7/2012 | OC-SW-ISCO2 ISCO2 8/23/2012 | OC-SW-ISCO2 ISCO2 11/16/2012 | OC-ISCO2 ISCO2 3/21/2013 | OC-ISCO2 ISCO2 5/13/2013 | OC-ISCO2 ISCO2 8/22/2013 | OC-ISCO2 ISCO2 11/21/2013 | OC-SW-PZ-16RR PZ-16RR 11/15/2010 | OC-SW-PZ-16RR-XXX PZ-16RR 12/9/2010 | OC-SW-PZ-16RRSW PZ-16RR 3/22/2011 | OC-SW-PZ-16RRSW PZ-16RR 5/16/2011 | OC-SW-PZ-16RR-XXX PZ-16RR 6/6/2011 | OC-SW-PZ-16RRSW PZ-16RR 8/23/2011 | OC-SW-PZ-16RR PZ-16RR 11/8/2011 |
|-------------------------------------|-----------------------------------|----------------------------------|-----------------------------------|------------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|--|---|---|---|--|---|---------------------------------------|
| Volatile Organics (mg/L) | | | | | | | | | | | | | | | |
| 1,3-Dichlorobenzene | | | | | | | | | | 0.001 U | | | | 0.0003 J | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | | | 0.0042 | | | | 0.0056 J | |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | | | 0.001 U | | | | 0.0012 | |
| 2-Butanone | | | | | | | | | | 0.01 U | | | | 0.01 U | |
| Acetone | | | | | | | | | | 0.05 U | | | | 0.05 U | |
| Bromodichloromethane | | | | | | | | | | 0.001 U | | | | 0.00021 J | |
| Bromoform | | | | | | | | | | 0.0017 J | | | | 0.0018 | |
| Carbon disulfide | | | | | | | | | | 0.01 U | | | | 0.01 U | |
| Chlorodibromomethane | | | | | | | | | | 0.0036 | | | | 0.00048 J | |
| Chloroform | | | | | | | | | | 0.0005 J | | | | 0.00049 J | |
| Dibromomethane | | | | | | | | | | 0.00055 J | | | | 0.00057 J | |
| Toluene | | | | | | | | | | 0.001 U | | | | 0.001 U | |
| Semivolatile Organics (mg/L) | | | | | | | | | | | | | | | |
| 2-Nitrophenol | | | | | | | | | | 0.001 J | | | | 0.0013 J | |
| 4-Nitrophenol | | | | | | | | | | 0.00072 J | | | | 0.0018 J | |
| Azobenzene | | | | | | | | | | 0.0045 U | | | | 0.00046 J | |
| Benzo(a)pyrene | | | | | | | | | | 0.00018 UJ | | | | 0.00018 U | |
| Benzoic Acid | | | | | | | | | | 0.0018 J | | | | 0.002 J | |
| Bis(2-Ethylhexyl)phthalate | | | | | | | | | | 0.0038 U | | | | 0.0018 U | |
| Diphenyl ether | | | | | | | | | | 0.00056 J | | | | 0.00062 J | |
| Diphenylmethanone | | | | | | | | | | 0.0045 U | | | | 0.001 J | |
| N-Nitrosodimethylamine | | | | | | | | | | 0.00017 | | | | 0.00017 J | |
| N-Nitrosodi-n-propylamine | | | | | | | | | | 0.000004 U | | | | 0.0000095 UJ | |
| N-Nitrosodiphenylamine | | | | | | | | | | 0.0045 U | | | | 0.0045 U | |
| Metals, Total (mg/L) | | | | | | | | | | | | | | | |
| Aluminum | 0.14 | 0.8 | 0.16 | 0.55 | 0.96 | 0.38 | 1.6 | 1 | 1.9 | 2.9 | 1.8 | 0.99 | 0.85 | 1.9 | 1.8 |
| Antimony | | | | | | | | | | 0.006 U | | | | 0.006 U | |
| Arsenic | | | | | | | | | | 0.0035 J | | | | 0.01 U | |
| Barium | | | | | | | | | | 0.023 | | | | 0.023 | |
| Beryllium | | | | | | | | | | 0.001 U | | | | 0.0003 J | |
| Calcium | | | | | | | | | | 57 | | | | 72 | |
| Chromium | 0.073 | 0.17 | 0.03 | 0.074 | 0.13 | 0.064 | 0.34 B | 0.18 | 0.39 | 0.61 | 0.38 | 0.19 | 0.27 | 0.56 | 0.38 |
| Cobalt | | | | | | | | | | 0.035 | | | | 0.041 | |
| Copper | | | | | | | | | | 0.0091 J | | | | 0.0064 | |
| Iron | | | | | | | | | | 5.7 | | | | 4.8 | |
| Lead | | | | | | | | | | 0.00039 J | | | | 0.0001 U | |
| Magnesium | | | | | | | | | | 12 | | | | 16 | |

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | OC-ISCO2-SW ISCO2 2/23/2012 | OC-SW- ISCO2 ISCO2 6/7/2012 | OC-SW- ISCO2 ISCO2 8/23/2012 | OC-SW- ISCO2 ISCO2 11/16/2012 | OC-ISCO2 ISCO2 3/21/2013 | OC-ISCO2 ISCO2 5/13/2013 | OC-ISCO2 ISCO2 8/22/2013 | OC-ISCO2 ISCO2 11/21/2013 | OC-SW-PZ- 16RR PZ-16RR 11/15/2010 | OC-SW-PZ- 16RR-XXX PZ-16RR 12/9/2010 | OC-SW-PZ- 16RRSW PZ-16RR 3/22/2011 | OC-SW-PZ- 16RRSW PZ-16RR 5/16/2011 | OC-SW-PZ- 16RR-XXX PZ-16RR 6/6/2011 | OC-SW-PZ- 16RRSW PZ-16RR 8/23/2011 | OC-SW-PZ- 16RR PZ-16RR 11/8/2011 |
|-----------------------------------|-----------------------------------|--------------------------------------|---------------------------------------|--|--------------------------------|--------------------------------|--------------------------------|---------------------------------|--|---|---|---|--|---|---|
| Manganese | | | | | | | | | | 1.6 | | | | 1.9 | |
| Mercury | | | | | | | | | | 0.0002 U | | | 0.00029 | | |
| Nickel | | | | | | | | | | 0.039 | | | 0.047 | | |
| Potassium | | | | | | | | | | 2.5 J | | | 2.2 J | | |
| Silver | | | | | | | | | | 0.001 UJ | | | 0.0001 U | | |
| Sodium | 140 | 84 J | 190 | 120 | 100 | 120 | 160 | 170 | 120 | 150 | 85 J | 69 | 200 | 160 J | 110 J |
| Thallium | | | | | | | | | | 0.01 U | | | 0.01 U | | |
| Vanadium | | | | | | | | | | 0.01 U | | | 0.01 U | | |
| Zinc | | | | | | | | | | 0.066 | | | 0.075 | | |
| Metals, Filtered (mg/L) | | | | | | | | | | | | | | | |
| Aluminum | 0.15 | 0.12 | 0.058 J | 0.14 J | 0.43 | 0.13 J | 0.31 | 0.2 U | 0.86 | | 0.46 | 0.18 | | 1.5 | 0.069 J |
| Chromium | 0.074 | 0.037 | 0.013 | 0.031 | 0.068 | 0.024 | 0.073 | 0.019 | 0.25 | | 0.12 | 0.062 | | 0.49 | 0.023 |
| Sodium | 150 | 83 | 200 | 120 | 100 | 110 | 160 | 180 | 130 | | 100 J | 80 | | 200 J | 130 J |
| Inorganics (mg/L) | | | | | | | | | | | | | | | |
| Bromide | | | | | | | | | | 0.36 | | | 0.43 | | |
| Chloride | 130 | 100 | 210 | 140 | 150 | 140 | 160 | 210 | 160 | 200 | 130 | 90 J | 190 | 190 | 120 |
| Hardness | | | | | | | | | | 190 | | | 240 | | |
| Lab Specific Conductance (mS/cm) | 1.5 | 1 | 2.1 | 1.3 | 0.85 | 1.2 | 1.5 | 1.8 | 1.5 | | 0.82 | 0.84 | | 2.3 | 0.95 |
| Nitrate as N | 1.2 | 0.55 | 2.1 | 2 J | 1.1 | 0.71 | 1.5 | 1.1 | 2 | 1.9 | 1.4 | 0.47 J | 0.26 | 0.39 | 1.8 |
| Nitrite as N | 0.1 U | 0.1 U | 0.1 U | R | 0.05 U | 0.023 J | 0.036 J | 0.026 J | 0.017 | 0.1 U | 0.1 U | 0.01 UJ | 0.01 U | 0.1 U | 0.1 U |
| Nitrogen, as Ammonia | 92 | 46 | 110 | 50 | 19 | 37 | 55 | 71 | 66 | 77 | 19 | 24 J | 110 | 110 | 31 |
| Sulfate | 420 | 250 | 690 | 330 | 150 | 290 | 360 | 490 | 520 | 660 | 120 | 200 J | 800 | 620 | 160 |
| Total Organic Carbon | | | | | | | | | | 13 | | | 10 | | |
| Total Suspended Solids | | | | | | | | | | 13 | | | 14 J | | |
| Specialty Compounds (mg/L) | | | | | | | | | | | | | | | |
| Hydrazine | | | | | | | | | | 0.0001 U | | | 0.0001 U | | |
| Formaldehyde | | | | | | | | | | 0.021 J | | | 0.03 U | | |
| 4,4'-Isopropylidenediphenol | | | | | | | | | | 0.00098 U | | | 0.00096 | | |
| 4-Nonylphenol (Tech.) | | | | | | | | | | 0.015 | | | 0.017 | | |
| Kempore (Azodicarbonamide) | | | | | | | | | | 1 U | | | 1.1 U | | |

(1) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.

mg/L = milligram per liter

mS/cm = millisiemen per centimeter

U = not detected,

value is the reporting limit

J = value is estimated

R = value is rejected

N = presumptively present

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | OC-SW-PZ16RR-SW PZ-16RR 2/23/2012 | OC-SW-PZ-16RRSW PZ-16RR 6/7/2012 | OC-SW-PZ-16RRSW PZ-16RR 8/23/2012 | OC-SW-PZ-16RRSW PZ-16RR 11/16/2012 | OC-PZ-16RRSW PZ-16RR 3/21/2013 | OC-PZ-16RRSW PZ-16RR 5/13/2013 | OC-PZ-16RRSW PZ-16RR 8/22/2013 | OC-PZ-16RRSW PZ-16RR 11/21/2013 | OC-SW-PZ-17RR XXX PZ-17RR 11/15/2010 | OC-SW-PZ-17RRXXX PZ-17RR 12/10/2010 | OC-SW-PZ-17RRSW PZ-17RR 3/22/2011 | OC-SW-PZ-17RRSW PZ-17RR 5/16/2011 | OC-SW-PZ-17RR-XXX PZ-17RR 6/6/2011 | OC-SW-PZ-17RRSW PZ-17RR 8/23/2011 | OC-SW-PZ17RR PZ-17RR 11/8/2011 |
|-------------------------------------|-----------------------------------|----------------------------------|-----------------------------------|------------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|--------------------------------------|-------------------------------------|-----------------------------------|-----------------------------------|------------------------------------|-----------------------------------|--------------------------------|
| Volatile Organics (mg/L) | | | | | | | | | | | | | | | |
| 1,3-Dichlorobenzene | | | | | | | | | | 0.001 U | | | | 0.00057 J | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | | | 0.0074 | | | | 0.01 J | |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | | | 0.0007 J | | | | 0.002 | |
| 2-Butanone | | | | | | | | | | 0.01 U | | | | 0.01 U | |
| Acetone | | | | | | | | | | 0.05 U | | | | 0.05 U | |
| Bromodichloromethane | | | | | | | | | | 0.00036 J | | | | 0.00051 | |
| Bromoform | | | | | | | | | | 0.0029 J | | | | 0.0034 | |
| Carbon disulfide | | | | | | | | | | 0.00058 J | | | | 0.01 U | |
| Chlorodibromomethane | | | | | | | | | | 0.0038 | | | | 0.001 | |
| Chloroform | | | | | | | | | | 0.00098 J | | | | 0.0012 | |
| Dibromomethane | | | | | | | | | | 0.001 | | | | 0.0011 | |
| Toluene | | | | | | | | | | 0.00046 J | | | | 0.00048 J | |
| Semivolatile Organics (mg/L) | | | | | | | | | | | | | | | |
| 2-Nitrophenol | | | | | | | | | | 0.0045 U | | | | 0.0018 J | |
| 4-Nitrophenol | | | | | | | | | | 0.0016 J | | | | 0.0021 J | |
| Azobenzene | | | | | | | | | | 0.0045 U | | | | 0.00053 J | |
| Benzo(a)pyrene | | | | | | | | | | 0.00018 U | | | | 0.00018 U | |
| Benzoic Acid | | | | | | | | | | 0.0045 UJ | | | | 0.0021 J | |
| Bis(2-Ethylhexyl)phthalate | | | | | | | | | | 0.0089 U | | | | 0.0018 U | |
| Diphenyl ether | | | | | | | | | | 0.00076 J | | | | 0.0011 J | |
| Diphenylmethanone | | | | | | | | | | 0.00052 J | | | | 0.0012 J | |
| N-Nitrosodimethylamine | | | | | | | | | | 0.0003 | | | | 0.00029 J | |
| N-Nitrosodi-n-propylamine | | | | | | | | | | 0.0000095 U | | | | 0.000021 UJ | |
| N-Nitrosodiphenylamine | | | | | | | | | | 0.00047 J | | | | 0.00064 J | |
| Metals, Total (mg/L) | | | | | | | | | | | | | | | |
| Aluminum | 0.64 J | 0.31 | 0.99 | 2.3 | 1.8 | 1.6 | 2.3 | 0.19 J | 3.4 | 11 | 1.3 | 1.5 | 9 | 5.7 | 2 |
| Antimony | | | | | | | | | | 0.006 U | | | | 0.006 U | |
| Arsenic | | | | | | | | | | 0.01 U | | | | 0.01 U | |
| Barium | | | | | | | | | | 0.025 | | | | 0.021 | |
| Beryllium | | | | | | | | | | 0.0011 | | | | 0.0011 | |
| Calcium | | | | | | | | | | 62 | | | | 72 | |
| Chromium | 0.34 | 0.14 J | 0.37 | 0.53 | 0.37 | 0.34 | 0.67 B | 0.041 | 0.79 | 2.2 | 0.3 | 0.36 | 1.8 | 1.3 | 0.47 |
| Cobalt | | | | | | | | | | 0.047 | | | | 0.05 | |
| Copper | | | | | | | | | | 0.026 J | | | | 0.021 | |
| Iron | | | | | | | | | | 10 | | | | 12 | |
| Lead | | | | | | | | | | 0.0012 | | | | 0.00042 J | |
| Magnesium | | | | | | | | | | 15 | | | | 17 | |

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | OC-SW-PZ16RR-SW PZ-16RR 2/23/2012 | OC-SW-PZ-16RRSW PZ-16RR 6/7/2012 | OC-SW-PZ-16RRSW PZ-16RR 8/23/2012 | OC-SW-PZ-16RRSW PZ-16RR 11/16/2012 | OC-PZ-16RRSW PZ-16RR 3/21/2013 | OC-PZ-16RRSW PZ-16RR 5/13/2013 | OC-PZ-16RRSW PZ-16RR 8/22/2013 | OC-PZ-16RRSW PZ-16RR 11/21/2013 | OC-SW-PZ-17RR XXX PZ-17RR 11/15/2010 | OC-SW-PZ-17RRXXX PZ-17RR 12/10/2010 | OC-SW-PZ-17RRSW PZ-17RR 3/22/2011 | OC-SW-PZ-17RRSW PZ-17RR 5/16/2011 | OC-SW-PZ-17RR-XXX PZ-17RR 6/6/2011 | OC-SW-PZ-17RRSW PZ-17RR 8/23/2011 | OC-SW-PZ17RR PZ-17RR 11/8/2011 |
|-----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|------------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|--------------------------------------|-------------------------------------|-----------------------------------|-----------------------------------|------------------------------------|-----------------------------------|--------------------------------|
| Manganese | | | | | | | | | 2.1 | | | | | 2.2 | |
| Mercury | | | | | | | | | 0.0002 U | | | | 0.0002 U | | |
| Nickel | | | | | | | | | 0.052 | | | | 0.057 | | |
| Potassium | | | | | | | | | 2.5 J | | | | 3.4 J | | |
| Silver | | | | | | | | | 0.001 UJ | | | | 0.0001 U | | |
| Sodium | 150 J | 88 J | 210 | 130 | 130 | 130 | 290 | 230 | 130 | 180 | 98 J | 81 | 220 | 160 J | 120 J |
| Thallium | | | | | | | | | 0.01 U | | | | 0.01 U | | |
| Vanadium | | | | | | | | | 0.01 UJ | | | | 0.01 U | | |
| Zinc | | | | | | | | | 0.083 | | | | 0.097 | | |
| Metals, Filtered (mg/L) | | | | | | | | | | | | | | | |
| Aluminum | 0.76 J | 0.36 | 0.14 | 1.1 | 0.53 | 0.3 | 1.1 | 0.12 J | 1.6 | | 0.39 | 0.29 | | 1.4 | 0.11 |
| Chromium | 0.36 | 0.16 J | 0.17 | 0.3 | 0.17 | 0.13 | 0.38 | 0.028 | 0.49 | | 0.12 | 0.16 | | 0.6 | 0.055 |
| Sodium | 170 J | 95 | 220 | 130 | 120 | 130 | 280 | 230 | 140 | | 110 J | 97 | | 190 J | 140 J |
| Inorganics (mg/L) | | | | | | | | | | | | | | | |
| Bromide | | | | | | | | | | 0.45 | | | | 0.48 | |
| Chloride | 160 | 120 | 230 | 140 | 190 | 160 | 280 | 250 | 160 | 240 | 160 | 120 J | 230 | 190 | 130 |
| Hardness | | | | | | | | | | 220 | | | | 250 | |
| Lab Specific Conductance (mS/cm) | 1.6 | 1.1 | 2.4 | 1.4 | 0.99 | 1.2 | 3.4 | 2.6 | 1.5 | | 0.9 | 0.98 | | 2.2 | 1 |
| Nitrate as N | 1.1 | 0.44 | 0.7 | 1.3 J | 0.6 | 0.56 | 0.72 | 0.87 | 0.53 | 0.69 | 1.9 | 0.35 J | 1.8 | 0.18 | 1.8 |
| Nitrite as N | 0.1 U | 0.1 U | 0.1 U | R | 0.05 U | 0.023 J | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.1 U | 0.01 UJ | 0.1 U | 0.1 U | 0.1 U |
| Nitrogen, as Ammonia | 100 | 48 | 140 | 52 | 23 | 40 | 160 | 120 | 66 | 96 | 17 | 30 J | 130 | 110 | 33 |
| Sulfate | 470 | 270 | 830 | 320 | 170 | 310 | 1100 | 800 | 530 | 810 | 120 | 230 J | 990 | 600 | 180 |
| Total Organic Carbon | | | | | | | | | | 20 | | | | 14 | |
| Total Suspended Solids | | | | | | | | | | 76 | | | | 70 J | |
| Specialty Compounds (mg/L) | | | | | | | | | | | | | | | |
| Hydrazine | | | | | | | | | | 0.0001 U | | | | 0.0001 U | |
| Formaldehyde | | | | | | | | | | 0.016 J | | | | 0.03 U | |
| 4,4'-Isopropylidenediphenol | | | | | | | | | | 0.00094 U | | | | 0.00087 J | |
| 4-Nonylphenol (Tech.) | | | | | | | | | | 0.014 | | | | 0.018 J | |
| Kempore (Azodicarbonamide) | | | | | | | | | | 1 U | | | | 1.1 NJ | |

(1) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.

mg/L = milligram per liter

mS/cm = millisiemen per centimeter

U = not detected,

value is the reporting limit

J = value is estimated

R = value is rejected

N = presumptively present

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | OC-SW-PZ-17RR-SW PZ-17RR 2/23/2012 | OC-SW-PZ-17RRSW PZ-17RR 6/7/2012 | OC-SW-PZ-17RRSW PZ-17RR 8/23/2012 | OC-SW-PZ-17RRSW PZ-17RR 11/16/2012 | OC-PZ-16RRSW PZ-16RR 3/21/2013 | OC-PZ-16RRSW PZ-16RR 5/13/2013 | OC-PZ-16RRSW PZ-16RR 8/22/2013 | OC-PZ-16RRSW PZ-16RR 11/21/2013 | OC-SW-PZ-17RR-XXX PZ-17RR 12/17/2012 | OC-SW-PZ-18R PZ-18R 11/15/2010 | OC-SW-PZ-18RSW PZ-18R 3/22/2011 | OC-SW-PZ-18RSW PZ-18R 5/16/2011 | OC-SW-PZ-18R PZ-18R 8/23/2011 | OC-SW-PZ18R PZ-18R 11/8/2011 | OC-PZ18R-SW PZ-18R 2/23/2012 |
|-------------------------------------|--|--|---|--|--------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|--|--------------------------------------|---------------------------------------|---------------------------------------|-------------------------------------|------------------------------------|------------------------------------|
| Volatile Organics (mg/L) | | | | | | | | | | | | | | | |
| 1,3-Dichlorobenzene | | | | | | | | | | 0.001 U | | | | | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | | | 0.0014 | | | | | |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | | | 0.001 U | | | | | |
| 2-Butanone | | | | | | | | | | 0.0071 J | | | | | |
| Acetone | | | | | | | | | | 0.0084 J | | | | | |
| Bromodichloromethane | | | | | | | | | | 0.0005 U | | | | | |
| Bromoform | | | | | | | | | | 0.001 U | | | | | |
| Carbon disulfide | | | | | | | | | | 0.01 U | | | | | |
| Chlorodibromomethane | | | | | | | | | | 0.0005 U | | | | | |
| Chloroform | | | | | | | | | | 0.001 U | | | | | |
| Dibromomethane | | | | | | | | | | 0.001 U | | | | | |
| Toluene | | | | | | | | | | 0.001 U | | | | | |
| Semivolatile Organics (mg/L) | | | | | | | | | | | | | | | |
| 2-Nitrophenol | | | | | | | | | | 0.00096 U | | | | | |
| 4-Nitrophenol | | | | | | | | | | 0.0048 UJ | | | | | |
| Azobenzene | | | | | | | | | | 0.00096 U | | | | | |
| Benzo(a)pyrene | | | | | | | | | | 0.00096 U | | | | | |
| Benzoic Acid | | | | | | | | | | R | | | | | |
| Bis(2-Ethylhexyl)phthalate | | | | | | | | | | 0.0048 U | | | | | |
| Diphenyl ether | | | | | | | | | | 0.00096 U | | | | | |
| Diphenylmethanone | | | | | | | | | | 0.00096 U | | | | | |
| N-Nitrosodimethylamine | | | | | | | | | | 0.000045 J | | | | | |
| N-Nitrosodi-n-propylamine | | | | | | | | | | 0.0000093 | | | | | |
| N-Nitrosodiphenylamine | | | | | | | | | | 0.00096 U | | | | | |
| Metals, Total (mg/L) | | | | | | | | | | | | | | | |
| Aluminum | 1 J | 0.54 | 7.6 | 3.8 | 1.8 | 1.6 | 2.3 | 0.19 J | 3.6 | 0.24 J | 0.25 | 0.18 | 0.14 | 0.27 | 0.082 J |
| Antimony | | | | | | | | | 0.006 U | | | | | | |
| Arsenic | | | | | | | | | 0.01 U | | | | | | |
| Barium | | | | | | | | | 0.021 | | | | | | |
| Beryllium | | | | | | | | | 0.00056 J | | | | | | |
| Calcium | | | | | | | | | 26 | | | | | | |
| Chromium | 0.51 | 0.26 | 1.8 | 0.92 | 0.37 | 0.34 | 0.67 B | 0.041 | 0.71 | 0.024 | 0.016 | 0.012 | 0.015 | 0.022 | 0.014 |
| Cobalt | | | | | | | | | 0.013 | | | | | | |
| Copper | | | | | | | | | 0.0096 J | | | | | | |
| Iron | | | | | | | | | 3.7 | | | | | | |
| Lead | | | | | | | | | 0.00056 J | | | | | | |
| Magnesium | | | | | | | | | 5.1 | | | | | | |

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | OC-SW-PZ-17RR-SW PZ-17RR 2/23/2012 | OC-SW-PZ-17RRSW PZ-17RR 6/7/2012 | OC-SW-PZ-17RRSW PZ-17RR 8/23/2012 | OC-SW-PZ-17RRSW PZ-17RR 11/16/2012 | OC-PZ-16RRSW PZ-16RR 3/21/2013 | OC-PZ-16RRSW PZ-16RR 5/13/2013 | OC-PZ-16RRSW PZ-16RR 8/22/2013 | OC-PZ-16RRSW PZ-16RR 11/21/2013 | OC-SW-PZ-17RR-XXX PZ-17RR 12/17/2012 | OC-SW-PZ-18R PZ-18R 11/15/2010 | OC-SW-PZ-18RSW PZ-18R 3/22/2011 | OC-SW-PZ-18RSW PZ-18R 5/16/2011 | OC-SW-PZ-18RSW PZ-18R 8/23/2011 | OC-SW-PZ18R PZ-18R 11/8/2011 | OC-PZ18R-SW PZ-18R 2/23/2012 |
|-----------------------------------|--|--|---|--|--------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|--|--------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|------------------------------------|------------------------------------|
| Manganese | | | | | | | | | | 0.85 | | | | | |
| Mercury | | | | | | | | | | 0.0002 U | | | | | |
| Nickel | | | | | | | | | | 0.014 | | | | | |
| Potassium | | | | | | | | | | 1.7 | | | | | |
| Silver | | | | | | | | | | 0.001 UJ | | | | | |
| Sodium | 190 J | 110 J | 240 | 140 | 130 | 130 | 290 | 230 | 88 | 71 J | 86 | 66 | 67 J | 88 | 98 J |
| Thallium | | | | | | | | | | 0.01 U | | | | | |
| Vanadium | | | | | | | | | | 0.0022 J | | | | | |
| Zinc | | | | | | | | | | 0.038 J | | | | | |
| Metals, Filtered (mg/L) | | | | | | | | | | | | | | | |
| Aluminum | 1.2 J | 0.53 | 1.9 | 0.93 | 0.53 | 0.3 | 1.1 | 0.12 J | | 0.15 J | 0.17 | 0.1 | 0.036 J | 0.17 | 0.092 J |
| Chromium | 0.54 | 0.26 | 0.83 | 0.36 | 0.17 | 0.13 | 0.38 | 0.028 | | 0.016 | 0.013 | 0.0073 | 0.0082 | 0.014 | 0.014 |
| Sodium | 220 J | 99 | 240 | 140 | 120 | 130 | 280 | 230 | | 81 J | 92 | 73 | 89 J | 96 | 120 J |
| Inorganics (mg/L) | | | | | | | | | | 0.2 U | | | | | |
| Bromide | | | | | | | | | | | | | | | |
| Chloride | 220 | 130 | 250 | 160 | 190 | 160 | 280 | 250 | 96 | 120 | 150 | 140 J | 110 | 120 | 140 |
| Hardness | | | | | | | | | | 80 | | | | | |
| Lab Specific Conductance (mS/cm) | 2 | 1.1 | 2.4 | 1.4 | 0.99 | 1.2 | 3.4 | 2.6 | | 0.79 | 0.69 | 0.64 | 0.79 | 0.78 | 1 |
| Nitrate as N | 3.4 | 0.35 | 0.36 | 0.69 J | 0.6 | 0.56 | 0.72 | 0.87 | 0.62 J | 0.25 | 0.43 | 0.14 J | 0.078 | 0.2 | 0.34 |
| Nitrite as N | 0.1 U | 0.1 U | 0.1 U | R | 0.05 U | 0.023 J | 0.05 U | 0.05 U | 0.022 J | 0.01 U | 0.1 U | 0.01 UJ | 0.01 U | 0.01 U | 0.1 U |
| Nitrogen, as Ammonia | 89 | 49 | 130 | 58 | 23 | 40 | 160 | 120 | 33 | 36 | 14 | 18 J | 33 | 30 | 51 |
| Sulfate | 550 | 280 | 850 | 350 | 170 | 310 | 1100 | 800 | 150 | 190 J | 75 | 89 J | 130 | 120 | 180 |
| Total Organic Carbon | | | | | | | | | | 7.6 | | | | | |
| Total Suspended Solids | | | | | | | | | | 19 | | | | | |
| Specialty Compounds (mg/L) | | | | | | | | | | | | | | | |
| Hydrazine | | | | | | | | | | | | | | | |
| Formaldehyde | | | | | | | | | | | | | | | |
| 4,4'-Isopropylidenediphenol | | | | | | | | | | | | | | | |
| 4-Nonylphenol (Tech.) | | | | | | | | | | | | | | | |
| Kempore (Azodicarbonamide) | | | | | | | | | | | | | | | |

(1) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.

mg/L = milligram per liter

mS/cm = millisiemen per centimeter

U = not detected,

value is the reporting limit

J = value is estimated

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N = presumptively present

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | OC-SW-PZ-18RSW PZ-18R 6/7/2012 | OC-SW-PZ-18RSW PZ-18R 8/23/2012 | OC-SW-PZ-18RSW PZ-18R 11/16/2012 | OC-PZ-18RSW PZ-18R 3/21/2013 | OC-PZ-18RSW PZ-18R 5/13/2013 | OC-PZ-18RSW PZ-18R 8/22/2013 | OC-PZ-18RSW PZ-18R 11/21/2013 | OC-SW-SD-17 SD-17 11/15/2010 | OC-SW-SD-17 SD-17 3/22/2011 |
|-------------------------------------|--------------------------------------|---------------------------------------|--|------------------------------------|------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-----------------------------------|
| Volatile Organics (mg/L) | | | | | | | | | |
| 1,3-Dichlorobenzene | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | | |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | | |
| 2-Butanone | | | | | | | | | |
| Acetone | | | | | | | | | |
| Bromodichloromethane | | | | | | | | | |
| Bromoform | | | | | | | | | |
| Carbon disulfide | | | | | | | | | |
| Chlorodibromomethane | | | | | | | | | |
| Chloroform | | | | | | | | | |
| Dibromomethane | | | | | | | | | |
| Toluene | | | | | | | | | |
| Semivolatile Organics (mg/L) | | | | | | | | | |
| 2-Nitrophenol | | | | | | | | | |
| 4-Nitrophenol | | | | | | | | | |
| Azobenzene | | | | | | | | | |
| Benzo(a)pyrene | | | | | | | | | |
| Benzoic Acid | | | | | | | | | |
| Bis(2-Ethylhexyl)phthalate | | | | | | | | | |
| Diphenyl ether | | | | | | | | | |
| Diphenylmethanone | | | | | | | | | |
| N-Nitrosodimethylamine | | | | | | | | | |
| N-Nitrosodi-n-propylamine | | | | | | | | | |
| N-Nitrosodiphenylamine | | | | | | | | | |
| Metals, Total (mg/L) | | | | | | | | | |
| Aluminum | 0.17 | 0.093 J | 0.21 | 0.18 J | 0.16 J | 0.2 U | 0.14 J | 3.6 | 1.3 |
| Antimony | | | | | | | | | |
| Arsenic | | | | | | | | | |
| Barium | | | | | | | | | |
| Beryllium | | | | | | | | | |
| Calcium | | | | | | | | | |
| Chromium | 0.018 | 0.013 | 0.02 | 0.012 | 0.012 | 0.0085 B | 0.012 | 0.85 | 0.3 |
| Cobalt | | | | | | | | | |
| Copper | | | | | | | | | |
| Iron | | | | | | | | | |
| Lead | | | | | | | | | |
| Magnesium | | | | | | | | | |

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | OC-SW-PZ-18RSW PZ-18R 6/7/2012 | OC-SW-PZ-18RSW PZ-18R 8/23/2012 | OC-SW-PZ-18RSW PZ-18R 11/16/2012 | OC-PZ-18RSW PZ-18R 3/21/2013 | OC-PZ-18RSW PZ-18R 5/13/2013 | OC-PZ-18RSW PZ-18R 8/22/2013 | OC-PZ-18RSW PZ-18R 11/21/2013 | OC-SW-SD-17 SD-17 11/15/2010 | OC-SW-SD-17 SD-17 3/22/2011 |
|-----------------------------------|--------------------------------------|---------------------------------------|--|------------------------------------|------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-----------------------------------|
| Manganese | | | | | | | | | |
| Mercury | | | | | | | | | |
| Nickel | | | | | | | | | |
| Potassium | | | | | | | | | |
| Silver | | | | | | | | | |
| Sodium | 65 J | 64 | 78 | 130 | 99 | 100 | 65 | 140 | 100 J |
| Thallium | | | | | | | | | |
| Vanadium | | | | | | | | | |
| Zinc | | | | | | | | | |
| Metals, Filtered (mg/L) | | | | | | | | | |
| Aluminum | 0.16 | 0.064 J | 0.12 J | 0.15 J | 0.078 J | 0.2 U | 0.066 J | 1.7 | 0.11 |
| Chromium | 0.015 | 0.011 | 0.015 | 0.013 | 0.0071 | 0.0049 J | 0.0061 | 0.5 | 0.058 |
| Sodium | 63 | 64 | 79 | 120 | 100 | 100 | 66 | 140 | 120 J |
| Inorganics (mg/L) | | | | | | | | | |
| Bromide | | | | | | | | | |
| Chloride | 110 | 100 | 110 | 210 | 160 | 170 | 110 | 170 | 170 |
| Hardness | | | | | | | | | |
| Lab Specific Conductance (mS/cm) | 0.64 | 0.63 | 0.73 | 0.87 | 0.81 | 0.98 | 0.61 | 1.6 | 0.94 |
| Nitrate as N | 0.27 | 0.14 | 0.35 J | 0.5 | 0.22 | 0.37 | 0.16 | 0.52 | 2.3 |
| Nitrite as N | 0.1 U | 0.1 U | R | 0.05 U | 0.02 J | 0.05 U | 0.05 U | 0.01 | 0.1 U |
| Nitrogen, as Ammonia | 28 | 27 | 24 | 14 | 28 | 33 | 18 J | 71 | 18 |
| Sulfate | 97 | 97 | 110 | 73 | 110 | 130 | 72 | 540 | 130 |
| Total Organic Carbon | | | | | | | | | |
| Total Suspended Solids | | | | | | | | | |
| Specialty Compounds (mg/L) | | | | | | | | | |
| Hydrazine | | | | | | | | | |
| Formaldehyde | | | | | | | | | |
| 4,4'-Isopropylidenediphenol | | | | | | | | | |
| 4-Nonylphenol (Tech.) | | | | | | | | | |
| Kempore (Azodicarbonamide) | | | | | | | | | |

(1) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.

mg/L = milligram per liter

mS/cm = millisiemen per centimeter

U = not detected,

value is the reporting limit

J = value is estimated

R = value is rejected

N = presumptively present

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | OC-SW-SD-17 SD-17 5/16/2011 | OC-SW-SD-17 SD-17 8/23/2011 | OC-SW-SD17 SD-17 11/8/2011 | OC-SD-17-SW SD-17 2/23/2012 | OC-SW-SD-17 SD-17 6/7/2012 | OC-SW-SD-17 SD-17 8/23/2012 | OC-SW-SD-17 SD-17 11/16/2012 | OC-SD-17 SD-17 3/21/2013 | OC-SD-17 SD-17 5/13/2013 | OC-SD-17 SD-17 8/22/2013 | OC-SD-17 SD-17 11/21/2013 | OC-SW-SD-1-XXX SD-1 12/9/2010 | OC-SW-SD-1-XXX SD-1 6/6/2011 | OC-SW-SD-1-XXX SD-1 12/17/2012 | |
|-------------------------------------|-----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|------------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|-------------------------------------|------------------------------------|--------------------------------------|------------|
| Volatile Organics (mg/L) | | | | | | | | | | | | | | | |
| 1,3-Dichlorobenzene | | | | | | | | | | | | | 0.001 U | 0.001 U | 0.001 U |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | | | | | | 0.003 | 0.0019 J | 0.001 U |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | | | | | | 0.001 U | 0.00044 J | 0.001 U |
| 2-Butanone | | | | | | | | | | | | | 0.01 U | 0.01 U | 0.025 J |
| Acetone | | | | | | | | | | | | | 0.05 U | 0.05 U | 0.012 J |
| Bromodichloromethane | | | | | | | | | | | | | 0.001 U | 0.0005 U | 0.0005 U |
| Bromoform | | | | | | | | | | | | | 0.0012 J | 0.00072 J | 0.001 U |
| Carbon disulfide | | | | | | | | | | | | | 0.01 U | 0.01 U | 0.01 U |
| Chlorodibromomethane | | | | | | | | | | | | | 0.0034 | 0.0005 U | 0.0005 U |
| Chloroform | | | | | | | | | | | | | 0.00037 J | 0.001 U | 0.001 U |
| Dibromomethane | | | | | | | | | | | | | 0.00038 J | 0.001 U | 0.001 U |
| Toluene | | | | | | | | | | | | | 0.001 U | 0.001 U | 0.001 U |
| Semivolatile Organics (mg/L) | | | | | | | | | | | | | | | |
| 2-Nitrophenol | | | | | | | | | | | | | 0.00072 J | 0.00067 J | 0.00099 U |
| 4-Nitrophenol | | | | | | | | | | | | | 0.0045 UJ | 0.005 U | 0.005 UJ |
| Azobenzene | | | | | | | | | | | | | 0.0045 U | 0.005 U | 0.00099 U |
| Benzo(a)pyrene | | | | | | | | | | | | | 0.00018 UJ | 0.0002 U | 0.00099 U |
| Benzoic Acid | | | | | | | | | | | | | 0.0045 UJ | 0.0021 J | R |
| Bis(2-Ethylhexyl)phthalate | | | | | | | | | | | | | 0.0035 U | 0.0018 J | 0.005 U |
| Diphenyl ether | | | | | | | | | | | | | 0.0045 U | 0.005 U | 0.00099 U |
| Diphenylmethanone | | | | | | | | | | | | | 0.0045 U | 0.005 U | 0.00099 U |
| N-Nitrosodimethylamine | | | | | | | | | | | | | 0.00014 | 0.000048 | 0.000024 J |
| N-Nitrosodi-n-propylamine | | | | | | | | | | | | | 0.000002 U | 0.000002 U | 0.0000049 |
| N-Nitrosodiphenylamine | | | | | | | | | | | | | 0.0045 U | 0.005 U | 0.00099 U |
| Metals, Total (mg/L) | | | | | | | | | | | | | | | |
| Aluminum | 1.4 | 1.2 | 2.1 | 0.78 J | 2.9 | 11 | 3.4 | 1.5 | 2.1 | 26 | 6.3 | 1.1 | 0.46 | 1.8 | |
| Antimony | | | | | | | | | | | | | 0.006 U | 0.006 U | 0.006 U |
| Arsenic | | | | | | | | | | | | | 0.01 U | 0.01 U | 0.01 U |
| Barium | | | | | | | | | | | | | 0.027 | 0.026 | 0.013 |
| Beryllium | | | | | | | | | | | | | 0.001 U | 0.001 U | 0.001 U |
| Calcium | | | | | | | | | | | | | 70 | 81 | 23 |
| Chromium | 0.33 | 0.28 | 0.47 | 0.37 J | 0.68 | 2.4 | 0.84 | 0.36 | 0.5 | 5.7 B | 1.3 | 0.23 | 0.11 | 0.29 | |
| Cobalt | | | | | | | | | | | | | 0.034 | 0.039 | 0.0076 |
| Copper | | | | | | | | | | | | | 0.0095 J | 0.00021 J | 0.0044 J |
| Iron | | | | | | | | | | | | | 3.7 | 2 | 1.5 |
| Lead | | | | | | | | | | | | | 0.00054 J | 0.0003 J | 0.00043 J |
| Magnesium | | | | | | | | | | | | | 13 | 17 | 3.3 |

Table 4.1-4
Summary of Detected Chemicals for Surface Water Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | OC-SW-SD-17 SD-17 5/16/2011 | OC-SW-SD-17 SD-17 8/23/2011 | OC-SW-SD17 SD-17 11/8/2011 | OC-SD-17-SW SD-17 2/23/2012 | OC-SW-SD-17 SD-17 6/7/2012 | OC-SW-SD-17 SD-17 8/23/2012 | OC-SW-SD-17 SD-17 11/16/2012 | OC-SD-17-SW SD-17 3/21/2013 | OC-SD-17 SD-17 5/13/2013 | OC-SD-17 SD-17 8/22/2013 | OC-SD-17 SD-17 11/21/2013 | OC-SW-SD-1-XXX SD-1 12/9/2010 | OC-SW-SD-1-XXX SD-1 6/6/2011 | OC-SW-SD-1-XXX SD-1 12/17/2012 | |
|-----------------------------------|-----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|------------------------------------|-----------------------------------|--------------------------------|--------------------------------|---------------------------------|-------------------------------------|------------------------------------|--------------------------------------|------------|
| Manganese | | | | | | | | | | | | | 1.8 | 2 | 0.5 |
| Mercury | | | | | | | | | | | | | 0.0002 U | 0.0002 U | 0.0002 U |
| Nickel | | | | | | | | | | | | | 0.036 | 0.041 | 0.009 J |
| Potassium | | | | | | | | | | | | | 3.2 J | 2.6 J | 1.3 |
| Silver | | | | | | | | | | | | | 0.001 UJ | 0.0001 U | 0.000017 J |
| Sodium | 82 | 96 J | 120 J | 180 J | 110 J | 190 | 130 | 110 | 140 | 320 | 260 | 160 | 220 | 52 | |
| Thallium | | | | | | | | | | | | 0.01 U | 0.01 U | 0.01 U | |
| Vanadium | | | | | | | | | | | | 0.01 U | 0.01 U | 0.01 U | |
| Zinc | | | | | | | | | | | | 0.076 | 0.055 | 0.025 J | |
| Metals, Filtered (mg/L) | | | | | | | | | | | | | | | |
| Aluminum | 0.34 | 0.92 | 1.9 | 0.89 J | 2.9 | 1 | 0.95 | 0.25 | 0.7 | 22 | 2.5 | | | | |
| Chromium | 0.16 | 0.28 | 0.37 | 0.41 J | 0.66 | 0.52 | 0.36 | 0.12 | 0.28 | 5 | 0.59 | | | | |
| Sodium | 97 | 140 J | 140 J | 210 J | 99 | 200 | 140 | 110 | 140 | 320 | 260 | | | | |
| Inorganics (mg/L) | | | | | | | | | | | | | | | |
| Bromide | | | | | | | | | | | | 0.34 | 0.46 | 0.2 U | |
| Chloride | 120 J | 130 | 130 | 210 | 130 | 210 | 170 | 160 | 180 | 320 | 300 | 200 | 300 | 64 | |
| Hardness | | | | | | | | | | | | 230 | 270 | 80 | |
| Lab Specific Conductance (mS/cm) | 0.98 | 1.1 | 1 | 1.8 | 1.1 | 2 | 1.5 | 0.89 | 1.3 | 3.7 | 2.8 | | | | |
| Nitrate as N | 0.42 J | 0.16 | 1.7 | 3.7 | 0.44 | 0.6 | 0.6 J | 0.71 | 0.44 | 0.41 | 0.63 | 2.8 | 6 | 0.96 J | |
| Nitrite as N | 0.01 UJ | 0.1 U | 0.01 U | 0.1 U | 0.1 U | 0.1 U | R | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.1 U | 0.1 U | 0.043 J | |
| Nitrogen, as Ammonia | 32 J | 41 | 32 | 77 | 60 | 110 | 61 | 20 | 47 | 180 | 130 | 66 | 95 | 21 | |
| Sulfate | 230 J | 240 | 190 | 460 | 280 | 670 | 350 | 140 | 310 | 1300 | 900 | 590 | 800 | 110 | |
| Total Organic Carbon | | | | | | | | | | | | 11 | 24 | 4.5 | |
| Total Suspended Solids | | | | | | | | | | | | 2.8 | 19 J | 6 | |
| Specialty Compounds (mg/L) | | | | | | | | | | | | | | | |
| Hydrazine | | | | | | | | | | | | 0.0001 U | 0.000076 J | | |
| Formaldehyde | | | | | | | | | | | | 0.018 J | 0.03 U | | |
| 4,4'-Isopropylidenediphenol | | | | | | | | | | | | 0.00097 U | | | |
| 4-Nonylphenol (Tech.) | | | | | | | | | | | | 0.0077 | | | |
| Kempore (Azodicarbonamide) | | | | | | | | | | | | 1 U | 1.4 N | | |

(1) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.

mg/L = milligram per liter

mS/cm = millisiemen per centimeter

U = not detected,

value is the reporting limit

J = value is estimated

R = value is rejected

N = presumptively present

Prepared by / Date: KJC 03/03/14

Checked by / Date: CTM 03/10/14

Table 4.1-5
Summary of Detected Chemicals for Surface Water Samples - Central Pond
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Detected Concentrations | | Average of All Samples | AWQC (1) (mg/L) | OC-SW-SD-501-XXX SD-501 12/17/2012 |
|-----------------------------|------------------------|----------------------------------|---|------------------------|-----------------|--|
| Metals, Total (mg/L) | | | | | | |
| Aluminum | 1 / 1 | 0.21 | - | 0.21 | 0.21 | 0.21 |
| Barium | 1 / 1 | 0.049 | - | 0.049 | 0.049 | 0.049 |
| Calcium | 1 / 1 | 190 | - | 190 | 190 | 190 |
| Chromium | 1 / 1 | 0.0085 | - | 0.0085 | 0.0085 | 0.0085 |
| Cobalt | 1 / 1 | 0.0012 | - | 0.0012 | 0.0012 | 0.0012 J |
| Copper | 1 / 1 | 0.0018 | - | 0.0018 | 0.0018 | 0.0018 J |
| Iron | 1 / 1 | 0.43 | - | 0.43 | 0.43 | 0.43 |
| Lead | 1 / 1 | 0.0009 | - | 0.0009 | 0.0009 | 0.0009 J |
| Magnesium | 1 / 1 | 13 | - | 13 | 13 | 13 |
| Manganese | 1 / 1 | 0.7 | - | 0.7 | 0.7 | 0.7 |
| Nickel | 1 / 1 | 0.0053 | - | 0.0053 | 0.0053 | 4.6 |
| Potassium | 1 / 1 | 7.6 | - | 7.6 | 7.6 | 7.6 |
| Silver | 1 / 1 | 0.000015 | - | 0.000015 | 0.000015 | 0.000015 J |
| Sodium | 1 / 1 | 68 | - | 68 | 68 | 68 |
| Zinc | 1 / 1 | 0.04 | - | 0.04 | 0.04 | 26 |
| Inorganics (mg/L) | | | | | | |
| Bromide | 1 / 1 | 0.13 | - | 0.13 | 0.13 | 0.13 J |
| Chloride | 1 / 1 | 52 | - | 52 | 52 | 52 |
| Hardness | 1 / 1 | 460 | - | 460 | 460 | 460 |
| Nitrate as N | 1 / 1 | 3.6 | - | 3.6 | 3.6 | 3.6 J |
| Nitrite as N | 1 / 1 | 0.075 | - | 0.075 | 0.075 | 0.075 J |
| Nitrogen, as Ammonia | 1 / 1 | 28 | - | 28 | 28 | (*) |
| Sulfate | 1 / 1 | 460 | - | 460 | 460 | 460 |
| Total Organic Carbon | 1 / 1 | 11 | - | 11 | 11 | 11 |

(1) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.

mg/L = milligram per liter

J = value is estimated

Prepared by / Date: KJC 03/03/14

Checked by / Date: CTM 03/10/14

Table 4.1-6
Summary of Detected Chemicals for Surface Water Samples - Detention Basin
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Detected Concentrations | | Average of All Samples | AWQC (1) (mg/L) | OC-SW-SD-503-XXX SD-503 12/17/2012 |
|-------------------------------------|------------------------|----------------------------------|---|------------------------|-----------------|--|
| Semivolatile Organics (mg/L) | | | | | | |
| N-Nitrosodimethylamine | 1 / 1 | 0.0000032 | - | 0.0000032 | 0.003 | 0.0000032 J |
| N-Nitrosodi-n-propylamine | 1 / 1 | 0.0000074 | - | 0.0000074 | 0.00051 | 0.0000074 |
| Metals, Total (mg/L) | | | | | | |
| Aluminum | 1 / 1 | 0.9 | - | 0.9 | | 0.9 |
| Barium | 1 / 1 | 0.026 | - | 0.026 | | 0.026 |
| Calcium | 1 / 1 | 53 | - | 53 | | 53 |
| Chromium | 1 / 1 | 0.0068 | - | 0.0068 | | 0.0068 J |
| Chromium, Hexavalent | 1 / 1 | 0.01 | - | 0.01 | | 0.01 |
| Copper | 1 / 1 | 0.0027 | - | 0.0027 | | 0.0027 J |
| Iron | 1 / 1 | 1.5 | - | 1.5 | | 1.5 |
| Lead | 1 / 1 | 0.003 | - | 0.003 | | 0.003 J |
| Magnesium | 1 / 1 | 2.4 | - | 2.4 | | 2.4 |
| Manganese | 1 / 1 | 0.12 | - | 0.12 | 0.1 | 0.12 |
| Nickel | 1 / 1 | 0.0014 | - | 0.0014 | 4.6 | 0.0014 J |
| Potassium | 1 / 1 | 4 | - | 4 | | 4 |
| Silver | 1 / 1 | 0.000056 | - | 0.000056 | | 0.000056 J |
| Sodium | 1 / 1 | 18 | - | 18 | | 18 |
| Vanadium | 1 / 1 | 0.002 | - | 0.002 | | 0.002 J |
| Zinc | 1 / 1 | 0.01 | - | 0.01 | 26 | 0.01 J |
| Inorganics (mg/L) | | | | | | |
| Chloride | 1 / 1 | 9 | - | 9 | | 9 |
| Hardness | 1 / 1 | 120 | - | 120 | | 120 |
| Nitrate as N | 1 / 1 | 0.084 | - | 0.084 | | 0.084 J |
| Nitrite as N | 1 / 1 | 0.026 | - | 0.026 | | 0.026 J |
| Nitrogen, as Ammonia | 1 / 1 | 7.5 | - | 7.5 | (*) | 7.5 |
| Sulfate | 1 / 1 | 96 | - | 96 | | 96 |
| Total Organic Carbon | 1 / 1 | 11 | - | 11 | | 11 |
| Total Suspended Solids | 1 / 1 | 38 | - | 38 | | 38 |

(1) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.

mg/L = milligram per liter

J = value is estimated

Prepared by / Date: KJC 03/03/14

Checked by / Date: CTM 03/10/14

Table 4.2-3
Summary of Detected Chemicals for Surface Water Samples - Off-Property West Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | Range of Detected Concentrations | | Average of All Samples | AWQC (1) | OC-SW-OPWD-1-XXX OPWD-1 12/10/2010 | OC-SW-OPWD-1-XXX OPWD-1 6/7/2011 | OC-SW-OPWD-2-XXX OPWD-2 12/10/2010 | OC-SW-OPWD-2-XXX OPWD-2 6/7/2011 |
|-------------------------------------|------------------------|---|----------------------------------|------------|------------------------|----------|--|--|--|--|
| Volatile Organics (mg/L) | | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | 3 / 6 | 0.001 : 0.001 | 0.00071 | - 0.0071 | 0.0020 | | 0.001 U | 0.001 UJ | 0.0025 | 0.0071 J |
| 2,4,4-Trimethyl-2-pentene | 1 / 6 | 0.001 : 0.001 | 0.0019 | - 0.0019 | 0.00073 | | 0.001 U | 0.001 U | 0.001 U | 0.0019 |
| Carbon disulfide | 3 / 6 | 0.01 : 0.01 | 0.001 | - 0.0025 | 0.0033 | | 0.001 J | 0.01 UJ | 0.01 U | 0.0025 J |
| Toluene | 1 / 6 | 0.001 : 0.001 | 0.0005 | - 0.0005 | 0.00050 | 15 | 0.001 U | 0.001 U | 0.001 U | 0.0005 J |
| Semivolatile Organics (mg/L) | | | | | | | | | | |
| 3 & 4 Methylphenol | 2 / 6 | 0.0045 : 0.005 | 0.00073 | - 0.00076 | 0.0018 | | 0.00073 J | 0.0045 U | 0.0045 U | 0.00076 J |
| 4-Nitrophenol | 1 / 6 | 0.0045 : 0.005 | 0.00075 | - 0.00075 | 0.0020 | | 0.0045 UJ | 0.0045 U | 0.0045 UJ | 0.0045 U |
| Acenaphthene | 1 / 6 | 0.00091 : 0.001 | 0.000047 | - 0.000047 | 0.00039 | 0.99 | 0.00091 U | 0.00091 U | 0.000047 J | 0.00091 U |
| Benzo(a)anthracene | 2 / 6 | 0.00027 : 0.0003 | 0.00024 | - 0.002 | 0.00047 | 0.000018 | 0.00027 U | 0.00027 U | 0.002 J | 0.00024 J |
| Benzo(a)pyrene | 4 / 6 | 0.00018 : 0.0002 | 0.00012 | - 0.0042 | 0.00089 | 0.000018 | 0.00012 J | 0.00022 | 0.0042 J | 0.00059 |
| Benzo(b)fluoranthene | 4 / 6 | 0.00027 : 0.0003 | 0.00019 | - 0.0077 | 0.0016 | 0.000018 | 0.00019 J | 0.00029 | 0.0077 J | 0.0011 |
| Benzo(ghi)perylene | 3 / 6 | 0.00045 : 0.0005 | 0.00011 | - 0.0046 | 0.00099 | | 0.00011 J | 0.00045 U | 0.0046 J | 0.00054 |
| Benzo(k)fluoranthene | 2 / 6 | 0.00027 : 0.0003 | 0.0005 | - 0.0026 | 0.00061 | 0.000018 | 0.00027 U | 0.00027 U | 0.0026 J | 0.0005 |
| Benzoic Acid | 5 / 6 | 0.0045 : 0.0045 | 0.0019 | - 0.0042 | 0.0024 | | 0.0021 J | 0.0019 J | 0.0042 J | 0.0021 J |
| Chrysene | 4 / 6 | 0.00091 : 0.001 | 0.00018 | - 0.0053 | 0.0012 | 0.000018 | 0.00018 J | 0.00018 J | 0.0053 J | 0.00067 J |
| Dibenz(a,h)anthracene | 1 / 6 | 0.00045 : 0.0005 | 0.0012 | - 0.0012 | 0.00039 | 0.000018 | 0.00045 U | 0.00045 U | 0.0012 J | 0.00045 U |
| Di-n-octylphthalate | 2 / 6 | 0.0045 : 0.005 | 0.00081 | - 0.00087 | 0.0018 | | 0.00087 J | 0.0045 U | 0.00081 J | 0.0045 U |
| Fluoranthene | 4 / 6 | 0.00091 : 0.001 | 0.00023 | - 0.0051 | 0.0012 | 0.14 | 0.00023 J | 0.00024 J | 0.0051 | 0.00092 |
| Fluorene | 1 / 6 | 0.00091 : 0.001 | 0.000056 | - 0.000056 | 0.00040 | 5.3 | 0.00091 U | 0.00091 U | 0.000056 J | 0.00091 U |
| Indeno(1,2,3-cd)pyrene | 3 / 6 | 0.00045 : 0.0005 | 0.000098 | - 0.004 | 0.00088 | 0.000018 | 0.000098 J | 0.00045 U | 0.004 J | 0.00049 |
| N-Nitrosodimethylamine | 5 / 6 | 0.000038 : 0.000038 | 5.6E-06 | - 0.00011 | 0.000049 | 0.003 | 0.00011 | 0.00006 | 0.0000056 | 0.000038 UJ |
| Phenanthrene | 4 / 6 | 0.00018 : 0.0002 | 0.000081 | - 0.0025 | 0.00053 | | 0.000081 J | 0.0001 J | 0.0025 | 0.00032 |
| Phenol | 1 / 6 | 0.0045 : 0.005 | 0.00051 | - 0.00051 | 0.0020 | 1700 | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.00051 J |
| Pyrene | 4 / 6 | 0.0045 : 0.005 | 0.00022 | - 0.012 | 0.0031 | 4 | 0.00022 J | 0.00028 J | 0.012 J | 0.0011 J |
| Metals, Total (mg/L) | | | | | | | | | | |
| Aluminum | 6 / 6 | | 0.1 | - 1.6 | 0.82 | | 1.1 | 0.83 | 0.96 | 1.6 |
| Arsenic | 2 / 6 | 0.01 : 0.01 | 0.0038 | - 0.012 | 0.0060 | 0.00014 | 0.01 U | 0.0038 J | 0.01 U | 0.012 |
| Barium | 6 / 6 | | 0.026 | - 0.046 | 0.035 | | 0.032 | 0.042 | 0.026 | 0.046 |
| Beryllium | 3 / 6 | 0.001 : 0.001 | 0.00017 | - 0.00026 | 0.00035 | | 0.00026 J | 0.00019 J | 0.001 U | 0.00017 J |
| Calcium | 6 / 6 | | 6.1 | - 28 | 18.7 | | 21 | 26 | 6.1 | 6.8 |
| Chromium | 6 / 6 | | 0.0061 | - 0.13 | 0.050 | | 0.13 | 0.099 | 0.0061 | 0.013 |
| Cobalt | 6 / 6 | | 0.0033 | - 0.018 | 0.0097 | | 0.018 | 0.017 | 0.0034 J | 0.0033 J |
| Copper | 6 / 6 | | 0.00079 | - 0.0061 | 0.0040 | | 0.0058 J | 0.0034 | 0.0061 J | 0.0039 |
| Iron | 6 / 6 | | 5 | - 30 | 16.4 | | 17 | 29 | 8.8 | 30 |
| Lead | 6 / 6 | | 0.00082 | - 0.0058 | 0.0027 | | 0.0025 | 0.002 | 0.0058 | 0.0041 |
| Magnesium | 6 / 6 | | 1.2 | - 5.4 | 3.5 | | 4.7 | 5.4 | 1.2 | 1.2 |
| Manganese | 6 / 6 | | 0.27 | - 1.5 | 0.85 | 0.1 | 1.3 | 1.5 | 0.27 | 0.27 |

Table 4.2-3
Summary of Detected Chemicals for Surface Water Samples - Off-Property West Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | | Average of All Samples | AWQC (1) (mg/L) | OC-SW-OPWD-1-XXX OPWD-1 12/10/2010 | OC-SW-OPWD-1-XXX OPWD-1 6/7/2011 | OC-SW-OPWD-2-XXX OPWD-2 12/10/2010 | OC-SW-OPWD-2-XXX OPWD-2 6/7/2011 |
|-----------------------------------|------------------------|---|--|----------------------------------|--|------------------------|--------------------|--|--|--|--|
| Nickel | 6 / 6 | | | 0.0041 - 0.018 | | 0.0090 | 4.6 | 0.018 | 0.012 | 0.005 J | 0.0051 J |
| Potassium | 4 / 6 | 4 : 4 | | 1.6 - 2.3 | | 2.0 | | 1.6 J | 2.3 J | 4 U | 4 U |
| Sodium | 6 / 6 | | | 41 - 120 | | 81 | | 100 | 120 | 41 | 42 |
| Vanadium | 4 / 6 | 0.01 : 0.01 | | 0.0026 - 0.012 | | 0.0057 | | 0.0026 J | 0.0031 J | 0.0062 J | 0.012 |
| Zinc | 6 / 6 | | | 0.009 - 0.12 | | 0.038 | 26 | 0.019 J | 0.019 J | 0.04 J | 0.12 |
| Inorganics (mg/L) | | | | | | | | | | | |
| Bromide | 5 / 6 | 0.1 : 0.1 | | 0.1 - 0.21 | | 0.15 | | 0.21 | 0.2 | 0.1 U | 0.1 |
| Chloride | 6 / 6 | | | 82 - 180 | | 139 | | 170 | 180 | 94 | 82 |
| Hardness | 6 / 6 | | | 20 - 87 | | 61 | | 72 | 87 | 20 | 22 |
| Nitrate as N | 1 / 6 | 0.05 : 0.05 | | 0.069 - 0.069 | | 0.032 | | 0.05 U | 0.05 U | 0.05 U | 0.05 U |
| Nitrite as N | 1 / 6 | 0.01 : 0.1 | | 0.02 - 0.02 | | 0.023 | | 0.01 U | 0.1 U | 0.02 | 0.01 U |
| Nitrogen, as Ammonia | 6 / 6 | | | 17 - 66 | | 45 (*) | | 66 | 63 | 17 | 36 |
| Sulfate | 6 / 6 | | | 66 - 360 | | 211 | | 360 | 320 | 66 | 69 |
| Total Organic Carbon | 6 / 6 | | | 5 - 17 | | 10.2 | | 11 | 5.9 | 13 | 17 |
| Total Suspended Solids | 6 / 6 | | | 11 - 250 | | 103 | | 62 | 77 | 190 | 250 |
| Specialty Compounds (mg/L) | | | | | | | | | | | |
| Formaldehyde | 3 / 4 | 0.03 : 0.03 | | 0.0064 - 0.02 | | 0.013 | | 0.02 J | 0.03 U | 0.0099 J | 0.0064 J |

(1) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.
mg/L = milligram per liter

U = not detected,
value is the reporting limit
J = value is estimated

Table 4.2-3
Summary of Detected Chemicals for Surface Water Samples - Off-Property West Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SW-OPWD-SD/SO/SW-S-XXX OPWD-SW-S 12/10/2010 | OC-SW-OPWD-SD/SO/SW-S-XXX OPWD-SW-S 6/7/2011 |
|-------------------------------------|--|--|
| Volatile Organics (mg/L) | | |
| 2,4,4-Trimethyl-1-pentene | 0.00071 J | 0.001 UJ |
| 2,4,4-Trimethyl-2-pentene | 0.001 U | 0.001 U |
| Carbon disulfide | 0.0011 J | 0.01 UJ |
| Toluene | 0.001 U | 0.001 U |
| Semivolatile Organics (mg/L) | | |
| 3 & 4 Methylphenol | 0.0045 U | 0.005 U |
| 4-Nitrophenol | 0.00075 J | 0.005 U |
| Acenaphthene | 0.00091 U | 0.001 U |
| Benzo(a)anthracene | 0.00027 U | 0.0003 U |
| Benzo(a)pyrene | 0.00018 U | 0.0002 U |
| Benzo(b)fluoranthene | 0.00027 U | 0.0003 U |
| Benzo(ghi)perylene | 0.00045 U | 0.0005 U |
| Benzo(k)fluoranthene | 0.00027 U | 0.0003 U |
| Benzoic Acid | 0.0045 UJ | 0.0021 J |
| Chrysene | 0.00091 U | 0.001 U |
| Dibenz(a,h)anthracene | 0.00045 U | 0.0005 U |
| Di-n-octylphthalate | 0.0045 U | 0.005 U |
| Fluoranthene | 0.00091 U | 0.001 U |
| Fluorene | 0.00091 U | 0.001 U |
| Indeno(1,2,3-cd)pyrene | 0.00045 U | 0.0005 U |
| N-Nitrosodimethylamine | 0.000076 | 0.000023 |
| Phenanthrene | 0.00018 U | 0.0002 U |
| Phenol | 0.0045 UJ | 0.005 UJ |
| Pyrene | 0.0045 U | 0.005 U |
| Metals, Total (mg/L) | | |
| Aluminum | 0.33 | 0.1 |
| Arsenic | 0.01 U | 0.01 U |
| Barium | 0.033 | 0.028 |
| Beryllium | 0.001 U | 0.001 U |
| Calcium | 28 | 24 |
| Chromium | 0.037 | 0.012 |
| Cobalt | 0.011 | 0.0056 J |
| Copper | 0.0041 J | 0.00079 |
| Iron | 8.3 | 5 |
| Lead | 0.00083 J | 0.00082 J |
| Magnesium | 4.2 | 4.2 |
| Manganese | 0.98 | 0.8 |

Table 4.2-3
Summary of Detected Chemicals for Surface Water Samples - Off-Property West Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SW-OPWD-SD/SO/SW-S-XXX OPWD-SW-S 12/10/2010 | OC-SW-OPWD-SD/SO/SW-S-XXX OPWD-SW-S 6/7/2011 |
|-----------------------------------|--|--|
| Nickel | 0.0096 J | 0.0041 J |
| Potassium | 2.1 J | 2.2 J |
| Sodium | 89 | 94 |
| Vanadium | 0.01 UJ | 0.01 U |
| Zinc | 0.018 J | 0.009 J |
| Inorganics (mg/L) | | |
| Bromide | 0.19 | 0.14 |
| Chloride | 180 | 130 |
| Hardness | 87 | 77 |
| Nitrate as N | 0.069 | 0.05 U |
| Nitrite as N | 0.01 U | 0.1 U |
| Nitrogen, as Ammonia | 48 | 37 |
| Sulfate | 290 | 160 |
| Total Organic Carbon | 9.3 | 5 |
| Total Suspended Solids | 28 | 11 |
| Specialty Compounds (mg/L) | | |
| Formaldehyde | | |

(1) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.
mg/L = milligram per liter

U = not detected,
value is the reporting limit
J = value is estimated

Prepared by / Date: KJC 03/04/14
Checked by / Date: CTM 03/10/14

Table 4.2-4
Summary of Detected Chemicals for Surface Water Samples - East Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | | Average of All Samples | East Ditch Background (mg/L) | AWQC (mg/L) | OC-SW-EDSD/SW0-XXX EDSD/SW0 12/13/2010 | OC-SW-EDSD/SW0-XXX EDSD/SW0 6/8/2011 | OC-SW-EDSD/SW1 (EDBS5)-XXX EDSD/SW1 (EDBS5) 12/13/2010 |
|---------------------------------------|------------------------|---|---|----------------------------------|----------|------------------------|------------------------------|-------------|--|--------------------------------------|--|
| Volatile Organics (mg/L) | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 2 / 10 | 0.001 | : | 0.001 | 0.001 | - | 0.0018 | 0.00068 | | | 0.001 U |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 5 / 10 | 0.001 | : | 0.001 | 0.0011 | - | 0.0031 | 0.0011 | | | 0.001 U |
| 1,1-Dichloroethane | 1 / 10 | 0.001 | : | 0.001 | 0.00033 | - | 0.00033 | 0.00048 | | | 0.001 U |
| 1,1-Dichloroethene | 1 / 10 | 0.001 | : | 0.001 | 0.00078 | - | 0.00078 | 0.00053 | | | 0.001 U |
| 2,4,4-Trimethyl-1-pentene | 2 / 10 | 0.001 | : | 0.001 | 0.0039 | - | 0.0044 | 0.0012 | | | 0.001 U |
| 2,4,4-Trimethyl-2-pentene | 1 / 10 | 0.001 | : | 0.001 | 0.00057 | - | 0.00057 | 0.00051 | | | 0.001 U |
| 2-Butanone | 2 / 10 | 0.01 | : | 0.01 | 0.0013 | - | 0.0029 | 0.0044 | | | 0.01 U |
| Acetone | 1 / 10 | 0.05 | : | 0.05 | 0.0039 | - | 0.0039 | 0.023 | | | 0.05 UJ |
| Chloroethane | 2 / 10 | 0.002 | : | 0.002 | 0.00044 | - | 0.0026 | 0.0011 | | | 0.002 U |
| Cis-1,2-Dichloroethene | 4 / 10 | 0.001 | : | 0.001 | 0.0011 | - | 0.0061 | 0.0015 | | | 0.001 U |
| Methyl Tertbutyl Ether | 1 / 10 | 0.001 | : | 0.001 | 0.00022 | - | 0.00022 | 0.00047 | | | 0.001 U |
| Tetrachloroethene | 1 / 10 | 0.001 | : | 0.001 | 0.00026 | - | 0.00026 | 0.00048 | | | 0.001 U |
| Toluene | 5 / 10 | 0.001 | : | 0.001 | 0.00067 | - | 0.0085 | 0.0016 | 0.0013 | 15 | 0.001 U |
| Trichloroethene | 4 / 10 | 0.001 | : | 0.0021 | 0.00047 | - | 0.0034 | 0.0011 | | | 0.00047 J |
| Vinyl chloride | 1 / 10 | 0.0005 | : | 0.0005 | 0.00052 | - | 0.00052 | 0.00028 | | | 0.0005 U |
| Xylene, o | 1 / 10 | 0.001 | : | 0.001 | 0.00024 | - | 0.00024 | 0.00047 | | | 0.001 U |
| Xylenes (m&p) | 1 / 10 | 0.002 | : | 0.002 | 0.00052 | - | 0.00052 | 0.00095 | | | 0.002 U |
| Semivolatile Organics (mg/L) | | | | | | | | | | | |
| Benzo(ghi)perylene | 4 / 10 | 0.00047 | : | 0.00053 | 0.000088 | - | 0.00018 | 0.00020 | 0.00014 | J | 0.00012 J |
| Benzoic Acid | 3 / 5 | 0.0047 | : | 0.0053 | 0.0019 | - | 0.0021 | 0.0022 | 0.0021 | J | R |
| Bis(2-Ethylhexyl)phthalate | 2 / 10 | 0.0018 | : | 0.0021 | 0.0012 | - | 0.0015 | 0.0010 | 0.00046 | J | 0.0022 |
| Caprolactam | 1 / 6 | 0.0047 | : | 0.0053 | 0.00073 | - | 0.00073 | 0.0022 | | | R |
| Dibenz(a,h)anthracene | 4 / 10 | 0.00047 | : | 0.00053 | 0.000081 | - | 0.00018 | 0.00020 | 0.00014 | J | 0.000018 |
| Indeno(1,2,3-cd)pyrene | 4 / 10 | 0.00047 | : | 0.00053 | 0.00009 | - | 0.00017 | 0.00020 | 0.00016 | J | 0.000018 |
| N-Nitrosodimethylamine | 4 / 10 | 1.9E-06 | : | 0.00002 | 3.3E-06 | - | 0.000012 | 0.0000045 | | | 0.003 |
| N-Nitrosodi-n-propylamine | 1 / 10 | 1.9E-06 | : | 0.00002 | 3.3E-06 | - | 3.3E-06 | 0.0000021 | | | 0.000051 |
| Metals, Total (mg/L) | | | | | | | | | | | |
| Aluminum | 19 / 22 | 0.1 | : | 0.2 | 0.028 | - | 0.77 | 0.16 | 1.1 | | 0.071 J |
| Arsenic | 2 / 10 | 0.01 | : | 0.01 | 0.005 | - | 0.0078 | 0.0053 | 0.0036 | J | 0.00014 |
| Barium | 10 / 10 | | | | 0.013 | - | 0.1 | 0.042 | 0.2 | | 0.028 |
| Calcium | 10 / 10 | | | | 11 | - | 46 | 34 | 79 | | 18 |
| Chromium | 11 / 22 | 0.005 | : | 0.005 | 0.00068 | - | 0.065 | 0.0054991 | 0.0022 | J | 0.005 U |
| Chromium, Hexavalent | 2 / 4 | 0.001 | : | 0.001 | 0.00056 | - | 0.00086 | 0.000605 | | | |
| Cobalt | 5 / 10 | 0.01 | : | 0.01 | 0.0016 | - | 0.0024 | 0.0036 | 0.003 | J | 0.01 U |
| Copper | 10 / 10 | | | | 0.00072 | - | 0.0055 | 0.0026 | 0.027 | | 0.0055 NJ |

Table 4.2-4
Summary of Detected Chemicals for Surface Water Samples - East Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | Average of All Samples | East Ditch Background (mg/L) | AWQC (mg/L) | OC-SW-EDSD/SW0-XXX EDSD/SW0 12/13/2010 | OC-SW-EDSD/SW0-XXX EDSD/SW0 6/8/2011 | OC-SW-EDSD/SW1 (EDBS5)-XXX EDSD/SW1 (EDBS5) 12/13/2010 |
|-----------------------------------|------------------------|---|--|----------------------------------|------------------------|------------------------------|-------------|--|--------------------------------------|--|
| Iron | 10 / 10 | | | 0.17 - 11 | 1.9 | 6.7 | | 0.17 | | 0.87 |
| Lead | 6 / 10 | 0.0001 : 0.001 | | 0.00035 - 0.0015 | 0.0005055 | 0.014 | | 0.00035 J | | 0.001 U |
| Magnesium | 10 / 10 | | | 1.4 - 6.9 | 4.8 | 7.7 | | | 1.8 | 3.6 |
| Manganese | 10 / 10 | | | 0.016 - 0.91 | 0.41 | 3.4 | 0.1 | 0.016 | | 0.17 |
| Nickel | 5 / 10 | 0.01 : 0.01 | | 0.0017 - 0.0039 | 0.0040 | 0.0037 | J 4.6 | 0.01 U | | 0.01 U |
| Potassium | 9 / 10 | 4 : 4 | | 1.6 - 6.1 | 3.2 | 9.6 | | | 1.6 J | 2 J |
| Silver | 1 / 10 | 0.0001 : 0.001 | | 0.00014 - 0.00014 | 0.000284 | | | 0.001 U | | 0.001 U |
| Sodium | 22 / 22 | | | 17 - 190 | 82 | 450 | | 76 | | 55 |
| Thallium | 1 / 10 | 0.01 : 0.01 | | 0.0052 - 0.0052 | 0.0050 | | | 0.00047 | 0.01 U | 0.01 U |
| Vanadium | 1 / 10 | 0.01 : 0.01 | | 0.0025 - 0.0025 | 0.0048 | 0.0022 | J | 0.01 UJ | | 0.01 UJ |
| Zinc | 8 / 10 | 0.05 : 0.05 | | 0.0088 - 0.053 | 0.028 | 0.023 | J 26 | 0.053 | | 0.025 J |
| Metals, Filtered (mg/L) | | | | | | | | | | |
| Aluminum | 8 / 12 | 0.1 : 0.2 | | 0.023 - 0.074 | 0.057 | | | | | |
| Chromium | 1 / 12 | 0.005 : 0.005 | | 0.00068 - 0.00068 | 0.0023 | | | | | |
| Sodium | 12 / 12 | | | 71 - 120 | 92 | | | | | |
| Inorganics (mg/L) | | | | | | | | | | |
| Bromide | 2 / 10 | 0.1 : 0.1 | | 0.11 - 0.18 | 0.069 | 0.13 | | 0.1 U | | 0.1 U |
| Chloride | 22 / 22 | | | 26 - 360 | 170 | 930 | | 140 | | 100 |
| Hardness | 10 / 10 | | | 34 - 140 | 106 | 230 | | 52 | | 83 |
| Lab Specific Conductance (mS/cm) | 12 / 12 | | | 0.67 - 0.92 | 0.77 | | | | | |
| Nitrate as N | 22 / 22 | | | 0.68 - 2.6 | 1.0 | 1.9 | | 1.8 | | 1 |
| Nitrogen, as Ammonia | 19 / 22 | 0.1 : 0.1 | | 0.11 - 10 | 2.7 | 0.4 | (*) | 0.1 U | | 0.11 |
| Sulfate | 22 / 22 | | | 14 - 99 | 36 | 16 | | 14 | | 17 |
| Total Organic Carbon | 10 / 10 | | | 1.2 - 5.1 | 2.9 | 12 | | 3 | | 2.9 |
| Total Suspended Solids | 5 / 10 | 2 : 5 | | 2 - 14 | 4.8 | 82 | | 2 U | | 2 U |
| Specialty Compounds (mg/L) | | | | | | | | | | |
| Kempore (Azodicarbonamide) | 2 / 10 | 1 : 3 | | 1.2 - 4.1 | 1.0 | | | 1 U | 3 U | 1 U |

Table 4.2-4
Summary of Detected Chemicals for Surface Water Samples - East Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SW-EDSD/SW1(E DBS5)-XXX EDSD/SW1 (EDBS5) 6/8/2011 | OC-SW-EDSD/SW2 (EDBS6)-XXX EDSD/SW2 (EDBS6) 12/13/2010 | OC-SW-EDSD/SW2(E DBS6)-XXX EDSD/SW2 (EDBS6) 6/8/2011 | OC-SW-EDSD/SW5 (EDBS11)- XXX EDSD/SW5 (EDBS11) 12/13/2010 | OC-SW-EDSD/SW5(E DBS11)-XXX EDSD/SW5 (EDBS11) 6/8/2011 | OC-SW-EDSD/SW7- XXX EDSD/SW7 11/6/2012 | OC-SW-EDSD/SW7- XXX EDSD/SW7 6/18/2012 | OC-SW-SD- EDSD/SW0- XXX EDSD/SW0 6/8/2011 | OC-SW- ISCO3 ISCO3 3/22/2011 | OC-SW- ISCO3 ISCO3 5/16/2011 |
|---------------------------------------|--|--|--|--|--|---|---|---|---------------------------------------|---------------------------------------|
| Volatile Organics (mg/L) | | | | | | | | | | |
| 1,1,1-Trichloroethane | 0.0018 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.0011 | 0.001 U | 0.001 U | 0.0015 | 0.0031 | 0.0013 | 0.001 U | 0.001 U | 0.001 U | |
| 1,1-Dichloroethane | 0.00033 J | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | |
| 1,1-Dichloroethene | 0.00078 J | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | |
| 2,4,4-Trimethyl-1-pentene | 0.001 UJ | 0.0044 | 0.0039 J | 0.001 U | 0.001 UJ | 0.001 U | 0.001 U | 0.001 U | 0.001 UJ | |
| 2,4,4-Trimethyl-2-pentene | 0.001 U | 0.001 U | 0.00057 J | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.001 U | 0.001 U | |
| 2-Butanone | 0.0029 J | 0.01 U | 0.01 U | 0.01 U | 0.0013 J | 0.01 U | 0.01 U | 0.01 U | 0.01 U | |
| Acetone | 0.05 U | 0.05 UJ | 0.05 U | 0.05 UJ | 0.05 U | 0.0039 J | 0.05 U | 0.05 U | 0.05 U | |
| Chloroethane | 0.0026 | 0.002 U | 0.00044 J | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | |
| Cis-1,2-Dichloroethene | 0.001 U | 0.001 U | 0.001 U | 0.0019 | 0.0061 | 0.0031 | 0.0011 | 0.001 U | | |
| Methyl Tertbutyl Ether | 0.00022 J | 0.001 U | 0.001 UJ | 0.001 U | 0.001 UJ | 0.001 U | 0.001 U | 0.001 U | 0.001 UJ | |
| Tetrachloroethene | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.00026 J | 0.001 U | 0.001 U | 0.001 U | 0.001 U | |
| Toluene | 0.001 | 0.0021 | 0.001 U | 0.00067 J | 0.00074 J | 0.001 U | 0.001 U | 0.001 U | 0.001 U | |
| Trichloroethene | 0.00048 J | 0.001 U | 0.001 U | 0.0027 | 0.0034 | 0.0021 U | 0.001 U | 0.001 U | 0.001 U | |
| Vinyl chloride | 0.0005 U | 0.0005 U | 0.0005 U | 0.0005 U | 0.00052 | 0.0005 U | 0.0005 U | 0.0005 U | 0.0005 U | |
| Xylene, o | 0.00024 J | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | |
| Xylenes (m&p) | 0.00052 J | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | |
| Semivolatile Organics (mg/L) | | | | | | | | | | |
| Benzo(ghi)perylene | 0.00048 U | 0.00015 J | 0.0005 U | 0.000088 J | 0.00053 U | 0.00049 U | 0.00047 U | 0.0005 U | | |
| Benzoic Acid | 0.0019 J | R | 0.0021 J | R | 0.0053 U | R | 0.0047 U | 0.0021 J | | |
| Bis(2-Ethylhexyl)phthalate | 0.0019 U | 0.0015 J | 0.002 U | 0.0012 J | 0.0021 U | 0.0019 U | 0.0019 U | 0.002 U | | |
| Caprolactam | 0.0048 UJ | R | 0.005 UJ | R | 0.0053 UJ | 0.0049 UJ | 0.0047 UJ | 0.00073 J | | |
| Dibenz(a,h)anthracene | 0.00048 U | 0.00013 J | 0.0005 U | 0.000081 J | 0.00053 U | 0.00049 U | 0.00047 U | 0.0005 U | | |
| Indeno(1,2,3-cd)pyrene | 0.00048 U | 0.00016 J | 0.0005 U | 0.00009 J | 0.00053 U | 0.00049 U | 0.00047 U | 0.0005 U | | |
| N-Nitrosodimethylamine | 0.0000019 U | 0.0000063 | 0.000012 | 0.000002 U | 0.00002 U | 0.0000019 UJ | 0.0000086 | 0.000002 U | | |
| N-Nitrosodi-n-propylamine | 0.0000019 U | 0.0000022 U | 0.000002 U | 0.000002 U | 0.00002 U | 0.0000019 U | 0.000002 U | 0.0000033 | | |
| Metals, Total (mg/L) | | | | | | | | | | |
| Aluminum | 0.1 U | 0.068 J | 0.028 J | 0.77 | 0.13 | 0.2 U | 0.12 | 0.39 | 0.23 | 0.18 |
| Arsenic | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.0078 J | 0.005 J | | |
| Barium | 0.057 | 0.026 | 0.057 | 0.013 | 0.033 | 0.036 | 0.04 | 0.1 | | |
| Calcium | 45 | 22 | 43 | 11 | 46 | 42 | 38 | 46 | | |
| Chromium | 0.005 U | 0.005 U | 0.005 U | 0.065 | 0.004 J | 0.0041 J | 0.0087 | 0.0014 J | 0.0013 J | 0.005 U |
| Chromium, Hexavalent | | 0.001 UJ | 0.00056 J | 0.00086 J | 0.001 UJ | | | | | |
| Cobalt | 0.01 U | 0.01 U | 0.0016 J | 0.002 J | 0.0024 J | 0.0024 J | 0.0022 J | 0.01 U | | |
| Copper | 0.00072 | 0.0033 NJ | 0.0014 | 0.003 NJ | 0.00084 | 0.0029 | 0.0019 | 0.0032 | | |

Table 4.2-4
Summary of Detected Chemicals for Surface Water Samples - East Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SW-EDSD/SW1(E DBS5)-XXX EDSD/SW1 (EDBS5) 6/8/2011 | OC-SW-EDSD/SW2 (EDBS6)-XXX EDSD/SW2 (EDBS6) 12/13/2010 | OC-SW-EDSD/SW2(E DBS6)-XXX EDSD/SW2 (EDBS6) 6/8/2011 | OC-SW-EDSD/SW5 (EDBS11)- XXX EDSD/SW5 (EDBS11) 12/13/2010 | OC-SW-EDSD/SW5(E DBS11)-XXX EDSD/SW5 (EDBS11) 6/8/2011 | OC-SW-EDSD/SW7- XXX EDSD/SW7 6/8/2011 | OC-SW-EDSD/SW7- XXX EDSD/SW7 11/6/2012 | OC-SW-SD- EDSD/SW0- XXX EDSD/SW0 6/8/2011 | OC-SW- ISCO3 ISCO3 3/22/2011 | OC-SW- ISCO3 ISCO3 5/16/2011 |
|-----------------------------------|--|--|--|--|--|--|---|---|---------------------------------------|---------------------------------------|
| Iron | 0.89 | 0.73 | 1 | 0.7 | 0.91 | 0.79 | 1.7 | 11 | | |
| Lead | 0.0001 U | 0.00067 J | 0.00013 U | 0.00086 J | 0.0001 U | 0.0005 J | 0.0015 | 0.00051 J | | |
| Magnesium | 6.6 | 3 | 6.5 | 1.4 | 6.9 | 6.5 | 6.1 | 5.2 | | |
| Manganese | 0.27 | 0.25 | 0.77 | 0.22 | 0.71 | 0.66 | 0.91 | 0.09 | | |
| Nickel | 0.01 U | 0.01 U | 0.0017 J | 0.0029 J | 0.0025 J | 0.0039 J | 0.0037 J | 0.01 U | | |
| Potassium | 2.7 J | 1.7 J | 2.8 J | 4 U | 3.6 J | 6.1 | 5.4 | 3.7 J | | |
| Silver | 0.0001 U | 0.001 U | 0.0001 U | 0.001 U | 0.0001 U | 0.001 U | 0.00014 | 0.0001 U | | |
| Sodium | 78 | 46 | 88 | 17 | 81 | 78 | 82 | 190 | 100 J | 87 |
| Thallium | 0.0052 J | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | | |
| Vanadium | 0.01 U | 0.01 UJ | 0.01 U | 0.01 UJ | 0.01 U | 0.01 U | 0.01 U | 0.0025 J | | |
| Zinc | 0.05 U | 0.016 J | 0.0088 J | 0.026 J | 0.05 U | 0.023 J | 0.021 J | 0.053 | | |
| Metals, Filtered (mg/L) | | | | | | | | | | |
| Aluminum | | | | | | | | | 0.045 J | 0.039 J |
| Chromium | | | | | | | | | 0.005 U | 0.005 U |
| Sodium | | | | | | | | | 120 J | 100 |
| Inorganics (mg/L) | | | | | | | | | | |
| Bromide | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.18 J | 0.11 | 0.1 U | | |
| Chloride | 190 | 93 | 220 | 26 | 180 | 130 | 140 | 360 | 210 | 190 J |
| Hardness | 140 | 68 | 140 | 34 | 140 | 140 | 120 | 140 | | |
| Lab Specific Conductance (mS/cm) | | | | | | | | | 0.91 | 0.92 |
| Nitrate as N | 0.68 | 0.73 | 0.81 | 0.87 | 0.93 | 1.6 | 1.1 | 2.6 J | 0.93 | 1.1 J |
| Nitrogen, as Ammonia | 0.1 U | 0.26 | 0.92 | 2.2 | 8.7 | 9 | 10 | 0.1 U | 5.3 | 8.2 J |
| Sulfate | 20 | 15 | 19 | 36 | 69 | 81 | 70 | 19 | 53 | 99 J |
| Total Organic Carbon | 2.1 | 2.6 | 1.2 | 5.1 | 1.5 | 4.4 | 4.3 | 2.3 | | |
| Total Suspended Solids | 5 U | 2 | 5 | 5.5 | 5 U | 4 U | 12 | 14 | | |
| Specialty Compounds (mg/L) | | | | | | | | | | |
| Kempore (Azodicarbonamide) | 1 U | 1 U | 4.1 N | 1 U | 1.2 N | 1 UJ | 1 U | | | |

Table 4.2-4
Summary of Detected Chemicals for Surface Water Samples - East Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SW- ISCO3 ISCO3 8/23/2011 | OC-SW- ISCO3 ISCO3 11/8/2011 | OC-ISCO3- SW ISCO3 2/23/2012 | OC-SW- ISCO3 ISCO3 6/7/2012 | OC-SW- ISCO3 ISCO3 8/23/2012 | OC-SW- ISCO3 ISCO3 11/16/2012 | OC-ISCO3 ISCO3 3/21/2013 | OC-ISCO3 ISCO3 5/13/2013 | OC-ISCO3 ISCO3 8/22/2013 | OC-ISCO3 ISCO3 11/21/2013 |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|--|--------------------------------|--------------------------------|--------------------------------|---------------------------------|
| Volatile Organics (mg/L) | | | | | | | | | | |
| 1,1,1-Trichloroethane | | | | | | | | | | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | | | | | | | | | |
| 1,1-Dichloroethane | | | | | | | | | | |
| 1,1-Dichloroethene | | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | | | |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | | | |
| 2-Butanone | | | | | | | | | | |
| Acetone | | | | | | | | | | |
| Chloroethane | | | | | | | | | | |
| Cis-1,2-Dichloroethene | | | | | | | | | | |
| Methyl Tertbutyl Ether | | | | | | | | | | |
| Tetrachloroethene | | | | | | | | | | |
| Toluene | | | | | | | | | | |
| Trichloroethene | | | | | | | | | | |
| Vinyl chloride | | | | | | | | | | |
| Xylene, o | | | | | | | | | | |
| Xylenes (m&p) | | | | | | | | | | |
| Semivolatile Organics (mg/L) | | | | | | | | | | |
| Benzo(ghi)perylene | | | | | | | | | | |
| Benzoic Acid | | | | | | | | | | |
| Bis(2-Ethylhexyl)phthalate | | | | | | | | | | |
| Caprolactam | | | | | | | | | | |
| Dibenz(a,h)anthracene | | | | | | | | | | |
| Indeno(1,2,3-cd)pyrene | | | | | | | | | | |
| N-Nitrosodimethylamine | | | | | | | | | | |
| N-Nitrosodi-n-propylamine | | | | | | | | | | |
| Metals, Total (mg/L) | | | | | | | | | | |
| Aluminum | 0.053 J | 0.2 | 0.039 J | 0.028 J | 0.54 | 0.14 J | 0.084 J | 0.093 J | 0.2 U | 0.062 J |
| Arsenic | | | | | | | | | | |
| Barium | | | | | | | | | | |
| Calcium | | | | | | | | | | |
| Chromium | 0.0012 J | 0.002 J | 0.00068 J | 0.005 U | 0.0035 J | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.0016 J |
| Chromium, Hexavalent | | | | | | | | | | |
| Cobalt | | | | | | | | | | |
| Copper | | | | | | | | | | |

Table 4.2-4
Summary of Detected Chemicals for Surface Water Samples - East Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SW- ISCO3 ISCO3 8/23/2011 | OC-SW- ISCO3 ISCO3 11/8/2011 | OC-ISCO3- SW ISCO3 2/23/2012 | OC-SW- ISCO3 ISCO3 6/7/2012 | OC-SW- ISCO3 ISCO3 8/23/2012 | OC-SW- ISCO3 ISCO3 11/16/2012 | OC-ISCO3 ISCO3 3/21/2013 | OC-ISCO3 ISCO3 5/13/2013 | OC-ISCO3 ISCO3 8/22/2013 | OC-ISCO3 ISCO3 11/21/2013 |
|-----------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|--|--------------------------------|--------------------------------|--------------------------------|---------------------------------|
| Iron | | | | | | | | | | |
| Lead | | | | | | | | | | |
| Magnesium | | | | | | | | | | |
| Manganese | | | | | | | | | | |
| Nickel | | | | | | | | | | |
| Potassium | | | | | | | | | | |
| Silver | | | | | | | | | | |
| Sodium | 82 J | 93 | 77 J | 71 J | 74 J | 78 | 85 | 90 | 96 | 86 |
| Thallium | | | | | | | | | | |
| Vanadium | | | | | | | | | | |
| Zinc | | | | | | | | | | |
| Metals, Filtered (mg/L) | | | | | | | | | | |
| Aluminum | 0.1 U | 0.028 J | 0.036 J | 0.025 J | 0.023 J | 0.2 U | 0.074 J | 0.2 U | 0.2 U | 0.062 J |
| Chromium | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.00068 J | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U |
| Sodium | 99 J | 100 | 88 J | 71 | 89 J | 78 | 87 | 88 | 96 | 90 |
| Inorganics (mg/L) | | | | | | | | | | |
| Bromide | | | | | | | | | | |
| Chloride | 200 | 170 | 140 | 160 | 180 | 150 | 170 | 180 | 210 | 190 |
| Hardness | | | | | | | | | | |
| Lab Specific Conductance (mS/cm) | 0.8 | 0.74 | 0.67 | 0.68 | 0.72 | 0.68 | 0.7 | 0.75 | 0.87 | 0.77 |
| Nitrate as N | 0.7 | 1 | 0.94 | 0.71 | 0.72 | 1 J | 0.87 | 0.85 | 1 | 0.78 |
| Nitrogen, as Ammonia | 1.7 | 1.7 | 2.4 | 1.8 | 1.7 | 1.1 | 1.2 | 1.4 | 0.19 | 0.27 |
| Sulfate | 22 | 33 | 36 | 34 | 26 | 29 | 35 | 29 | 25 | 21 |
| Total Organic Carbon | | | | | | | | | | |
| Total Suspended Solids | | | | | | | | | | |
| Specialty Compounds (mg/L) | | | | | | | | | | |
| Kempore (Azodicarbonamide) | | | | | | | | | | |

Table 4.2-4
Summary of Detected Chemicals for Surface Water Samples - East Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | Range of Detected Concentrations | Average of All Samples | East Ditch Background (mg/L) | AWQC (mg/L) | OC-SW-EDSD/SW0-XXX EDSD/SW0 12/13/2010 | OC-SW-EDSD/SW0-XXX EDSD/SW0 6/8/2011 | OC-SW-EDSD/SW1 (EDBS5)-XXX EDSD/SW1 (EDBS5) 12/13/2010 |
|-----------|------------------------|---|----------------------------------|------------------------|------------------------------|-------------|---|---|---|
|-----------|------------------------|---|----------------------------------|------------------------|------------------------------|-------------|---|---|---|

Notes:

- (1) Background location identified for the East Ditch is located at SDBK-001.
- (2) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).
- (*) - Freshwater criteria are pH, temperature, and life-stage dependent.

mg/L = milligram per liter

mS/cm = millisiemen per centimeter

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected

N = presumptively present

Prepared by / Date: KJC 03/04/14

Checked by / Date: CTM 03/10/14

Table 4.2-5
Summary of Detected Chemicals for Surface Water Samples - Landfill Brook
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | | Average of All Samples | AWQC (mg/L) | OC-SW-LB-1-XXX LB-1 12/9/2010 | OC-SW-LB-1-XXX LB-1 6/7/2011 | OC-SW-LB-2-XXX LB-2 6/7/2011 | OC-SW-LB-3-XXX LB-3 12/9/2010 | OC-SW-LB-3-XXX LB-3 6/7/2011 | OC-SW-LB-S2-XXX LB-2 12/9/2010 | | |
|-------------------------------------|------------------------|---|---|----------------------------------|---------|------------------------|-------------|----------------------------------|---------------------------------|---------------------------------|----------------------------------|---------------------------------|-----------------------------------|------------|-----------|
| Volatile Organics (mg/L) | | | | | | | | | | | | | | | |
| 1,1-Dichloroethane | 1 / 6 | 0.001 | : | 0.001 | 0.00028 | - | 0.00028 | 0.00046 | | 0.001 U | 0.001 U | 0.001 U | 0.00028 J | 0.001 U | 0.001 U |
| 2-Butanone | 1 / 6 | 0.01 | : | 0.01 | 0.0014 | - | 0.0014 | 0.0044 | | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.0014 J | 0.01 U |
| 4-iso-Propyltoluene | 1 / 6 | 0.001 | : | 0.001 | 0.00025 | - | 0.00025 | 0.00046 | | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.00025 J | 0.001 U |
| Carbon disulfide | 1 / 6 | 0.01 | : | 0.01 | 0.00043 | - | 0.00043 | 0.0042 | | 0.01 U | 0.00043 J | 0.01 UJ | 0.01 U | 0.01 UJ | 0.01 U |
| Methyl Tertbutyl Ether | 6 / 6 | | | | 0.0002 | - | 0.00056 | 0.00039 | | 0.00056 J | 0.0002 J | 0.00047 J | 0.00028 J | 0.00035 J | 0.00049 J |
| Toluene | 3 / 6 | 0.001 | : | 0.001 | 0.00036 | - | 0.0046 | 0.0012 | 15 | 0.001 U | 0.00036 J | 0.001 U | 0.00044 J | 0.0046 | 0.001 U |
| Semivolatile Organics (mg/L) | | | | | | | | | | | | | | | |
| 3 & 4 Methylphenol | 1 / 6 | 0.0045 | : | 0.0045 | 0.0018 | - | 0.0018 | 0.0022 | | 0.0018 J | 0.0045 U | 0.0045 U | 0.0045 U | 0.0045 U | 0.0045 U |
| Benzo(a)anthracene | 1 / 6 | 0.00027 | : | 0.00027 | 0.00052 | - | 0.00052 | 0.00020 | 0.000018 | 0.00052 | 0.00027 U | 0.00027 U | 0.00027 U | 0.00027 U | 0.00027 U |
| Benzo(a)pyrene | 2 / 6 | 0.00018 | : | 0.00018 | 0.00017 | - | 0.001 | 0.00026 | 0.000018 | 0.001 | 0.00018 U | 0.00017 J | 0.00018 UJ | 0.00018 U | 0.00018 U |
| Benzo(b)fluoranthene | 2 / 6 | 0.00027 | : | 0.00027 | 0.00013 | - | 0.0015 | 0.00036 | 0.000018 | 0.0015 | 0.00027 UJ | 0.00013 J | 0.00027 UJ | 0.00027 UJ | 0.00027 U |
| Benzo(ghi)perylene | 1 / 6 | 0.00045 | : | 0.00045 | 0.0016 | - | 0.0016 | 0.00045 | | 0.0016 | 0.00045 U | 0.00045 U | 0.00045 U | 0.00045 U | 0.00045 U |
| Benzo(k)fluoranthene | 2 / 6 | 0.00027 | : | 0.00027 | 0.00015 | - | 0.00061 | 0.00022 | 0.000018 | 0.00061 | 0.00027 U | 0.00015 J | 0.00027 UJ | 0.00027 U | 0.00027 U |
| Benzoic Acid | 4 / 6 | 0.0045 | : | 0.0045 | 0.0019 | - | 0.0043 | 0.0024 | | 0.0043 J | 0.002 J | 0.0019 J | 0.0045 UJ | 0.0019 J | 0.0045 UJ |
| Benzyl alcohol | 1 / 6 | 0.0091 | : | 0.0091 | 0.00076 | - | 0.00076 | 0.0039 | | 0.00076 J | 0.0091 U | 0.0091 U | 0.0091 U | 0.0091 U | 0.0091 U |
| Bis(2-Ethylhexyl)phthalate | 1 / 6 | 0.0018 | : | 0.027 | 0.00074 | - | 0.00074 | 0.0033 | 0.0022 | 0.027 UJ | 0.00074 J | 0.0018 U | 0.0045 U | 0.0018 U | 0.0032 U |
| Chrysene | 1 / 6 | 0.00091 | : | 0.00091 | 0.001 | - | 0.001 | 0.00055 | 0.000018 | 0.001 | 0.00091 U | 0.00091 U | 0.00091 U | 0.00091 U | 0.00091 U |
| Fluoranthene | 1 / 6 | 0.00091 | : | 0.00091 | 0.001 | - | 0.001 | 0.00055 | 0.14 | 0.001 | 0.00091 U | 0.00091 U | 0.00091 U | 0.00091 U | 0.00091 U |
| Indeno(1,2,3-cd)pyrene | 2 / 6 | 0.00045 | : | 0.00045 | 0.0002 | - | 0.0012 | 0.00038 | 0.000018 | 0.0012 | 0.00045 U | 0.0002 J | 0.00045 UJ | 0.00045 U | 0.00045 U |
| Phenanthrene | 1 / 6 | 0.00018 | : | 0.00018 | 0.00041 | - | 0.00041 | 0.00014 | | 0.00041 | 0.00018 U | 0.00018 U | 0.00018 U | 0.00018 U | 0.00018 U |
| Pyrene | 1 / 6 | 0.0045 | : | 0.0045 | 0.0014 | - | 0.0014 | 0.0021 | 4 | 0.0014 J | 0.0045 U | 0.0045 U | 0.0045 U | 0.0045 U | 0.0045 U |
| Metals, Total (mg/L) | | | | | | | | | | | | | | | |
| Aluminum | 4 / 6 | 0.1 | : | 0.1 | 0.035 | - | 12 | 2.4 | | 12 | 1.2 | 1 | 0.1 U | 0.035 J | 0.1 U |
| Arsenic | 6 / 6 | | | | 0.0048 | - | 0.047 | 0.022 | 0.00014 | 0.03 | 0.011 | 0.034 | 0.007 J | 0.047 | 0.0048 J |
| Barium | 6 / 6 | | | | 0.039 | - | 0.26 | 0.091 | | 0.26 | 0.095 | 0.053 | 0.04 | 0.056 | 0.039 |
| Cadmium | 1 / 6 | 0.001 | : | 0.001 | 0.0028 | - | 0.0028 | 0.00088 | | 0.0028 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| Calcium | 6 / 6 | | | | 24 | - | 53 | 38 | | 53 | 31 | 24 | 49 | 44 | 25 |
| Chromium | 6 / 6 | | | | 0.0015 | - | 0.047 | 0.013 | | 0.047 | 0.0054 | 0.02 | 0.0017 J | 0.0039 J | 0.0015 J |
| Cobalt | 3 / 6 | 0.01 | : | 0.01 | 0.0014 | - | 0.01 | 0.0048 | | 0.01 | 0.0026 J | 0.0014 J | 0.01 U | 0.01 U | 0.01 U |
| Copper | 6 / 6 | | | | 0.0036 | - | 0.051 | 0.016 | | 0.051 J | 0.012 | 0.0087 | 0.01 J | 0.0087 | 0.0036 J |
| Iron | 6 / 6 | | | | 1.6 | - | 33 | 13.7 | | 33 | 15 | 18 | 2.6 | 12 | 1.6 |
| Lead | 5 / 6 | 0.001 | : | 0.001 | 0.00042 | - | 0.24 | 0.049 | | 0.24 | 0.027 | 0.022 | 0.001 U | 0.00042 J | 0.0015 |
| Magnesium | 6 / 6 | | | | 3.3 | - | 8.1 | 5.3 | | 8.1 | 3.3 | 3.6 | 6.6 | 6.1 | 4 |
| Manganese | 6 / 6 | | | | 0.54 | - | 2.2 | 1.2 | 0.1 | 1.6 | 0.54 | 0.99 | 1.4 | 2.2 | 0.76 |
| Mercury | 2 / 6 | 0.0002 | : | 0.0002 | 0.00027 | - | 0.00055 | 0.00020 | | 0.00055 | 0.0002 U | 0.0002 U | 0.0002 U | 0.00027 | 0.0002 U |
| Nickel | 3 / 6 | 0.01 | : | 0.01 | 0.0023 | - | 0.019 | 0.0068 | 4.6 | 0.019 | 0.0046 J | 0.0023 J | 0.01 U | 0.01 U | 0.01 U |
| Potassium | 6 / 6 | | | | 1.4 | - | 8 | 5.2 | | 6.9 | 1.4 J | 4.1 | 8 | 5.7 | 4.8 |
| Sodium | 6 / 6 | | | | 81 | - | 190 | 119 | | 190 | 180 | 83 | 87 | 94 | 81 |

Table 4.2-5
Summary of Detected Chemicals for Surface Water Samples - Landfill Brook
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | Range of Detected Concentrations | Average of All Samples | AWQC (mg/L) | OC-SW-LB-1-XXX LB-1 12/9/2010 | OC-SW-LB-1-XXX LB-1 6/7/2011 | OC-SW-LB-2-XXX LB-2 6/7/2011 | OC-SW-LB-3-XXX LB-3 6/7/2011 | OC-SW-LB-3-XXX LB-3 12/9/2010 | OC-SW-LB-S2-XXX LB-2 6/7/2011 | OC-SW-LB-S2-XXX LB-2 12/9/2010 |
|--------------------------|------------------------|---|----------------------------------|------------------------|-------------|-------------------------------------|------------------------------------|------------------------------------|------------------------------------|-------------------------------------|-------------------------------------|--------------------------------------|
| Tin | 1 / 6 | 0.05 : 0.05 | 0.007 - 0.007 | 0.022 | | 0.007 J | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U |
| Vanadium | 3 / 6 | 0.01 : 0.01 | 0.0047 - 0.038 | 0.011 | | 0.038 | 0.007 J | 0.0047 J | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Zinc | 5 / 6 | 0.05 : 0.05 | 0.0073 - 0.5 | 0.12 | 26 | 0.5 | 0.11 | 0.038 J | 0.0073 J | 0.05 U | 0.05 U | 0.023 J |
| Inorganics (mg/L) | | | | | | | | | | | | |
| Chloride | 6 / 6 | | 140 - 410 | 232 | | 410 | 360 | 150 | 160 | 140 | 170 | |
| Hardness | 6 / 6 | | 74 - 170 | 117 | | 170 | 90 | 74 | 150 | 140 | 79 | |
| Nitrate as N | 4 / 6 | 0.05 : 0.05 | 0.13 - 0.94 | 0.48 | | 0.05 U | 0.05 UJ | 0.91 | 0.87 | 0.13 | 0.94 | |
| Nitrogen, as Ammonia | 6 / 6 | | 0.52 - 8.7 | 4.3 | (*) | 1.3 | 0.52 | 3.7 | 6.9 | 8.7 | 4.6 | |
| Sulfate | 6 / 6 | | 4.4 - 88 | 33 | | 88 | 4.4 | 17 | 39 | 16 | 35 | |
| Total Organic Carbon | 6 / 6 | | 3.4 - 30 | 10.7 | | 30 | 13 | 3.4 | 7.3 | 5.8 | 4.9 | |
| Total Suspended Solids | 6 / 6 | | 5 - 1100 | 211 | | 1100 | 32 | 94 | 5 | 26 | 7 | |

Notes:

(1) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.

mg/L = milligram per liter

U = not detected, value is the reporting limit

J = value is estimated

Prepared by / Date: KJC 03/04/14

Checked by / Date: CTM 03/10/14

Table 4.2-6
Summary of Detected Chemicals for Surface Water Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | | Average of All Samples | Maple Meadow Brook Wetland Background (1) | AWQC (2) (mg/L) | OC-SW-MMB-SW/SD-10-XXX MMB-SW/SD-10 12/2/2010 | OC-SW-MMB-SW/SD-10-XXX MMB-SW/SD-10 6/6/2011 |
|-------------------------------------|------------------------|---|---|----------------------------------|----------|------------------------|---|-----------------|---|--|
| Volatile Organics (mg/L) | | | | | | | | | | |
| Carbon disulfide | 3 / 22 | 0.01 | : | 0.01 | 0.00027 | - | 0.00029 | 0.0044 | | 0.01 U |
| Cis-1,2-Dichloroethene | 2 / 22 | 0.001 | : | 0.001 | 0.0002 | - | 0.00062 | 0.00049 | | 0.001 U |
| Methyl Tertbutyl Ether | 4 / 22 | 0.001 | : | 0.001 | 0.0002 | - | 0.00033 | 0.00046 | | 0.001 U |
| Toluene | 3 / 22 | 0.001 | : | 0.001 | 0.00034 | - | 0.00075 | 0.00050 | 15 | 0.001 U |
| Trichloroethene | 1 / 22 | 0.001 | : | 0.001 | 0.0004 | - | 0.0004 | 0.00050 | 0.03 | 0.001 U |
| Semivolatile Organics (mg/L) | | | | | | | | | | |
| 3 & 4 Methylphenol | 1 / 22 | 0.0045 | : | 0.005 | 0.00074 | - | 0.00074 | 0.0022 | | 0.0045 U |
| Benzo(a)pyrene | 2 / 22 | 0.00018 | : | 0.0002 | 0.000096 | - | 0.00013 | 0.000094 | 0.000018 | 0.00018 U |
| Benzo(b)fluoranthene | 1 / 22 | 0.00027 | : | 0.0003 | 0.00013 | - | 0.00013 | 0.00014 | 0.000018 | 0.00027 U |
| Benzo(ghi)perylene | 1 / 22 | 0.00045 | : | 0.0005 | 0.000089 | - | 0.000089 | 0.00022 | | 0.00045 U |
| Benzoic Acid | 9 / 20 | 0.0045 | : | 0.0045 | 0.0019 | - | 0.0024 | 0.0022 | 0.0021 J | 0.0045 UJ |
| Caprolactam | 2 / 22 | 0.0045 | : | 0.005 | 0.00066 | - | 0.00066 | 0.0021 | 0.00056 J | 0.0045 UJ |
| Di-n-butylphthalate | 5 / 22 | 0.0045 | : | 0.005 | 0.00056 | - | 0.00098 | 0.0019 | | 4.5 U |
| N-Nitrosodimethylamine | 1 / 22 | 1.9E-06 | : | 0.000038 | 4.7E-07 | - | 4.7E-07 | 0.0000041 | | 0.003 U |
| N-Nitrosodi-n-propylamine | 3 / 22 | 1.9E-06 | : | 0.000038 | 4.4E-07 | - | 7.8E-07 | 0.0000041 | 0.00051 | 0.0000019 U |
| Phenol | 1 / 22 | 0.0045 | : | 0.005 | 0.00083 | - | 0.00083 | 0.0022 | 1700 | 0.0045 UJ |
| Metals, Total (mg/L) | | | | | | | | | | |
| Aluminum | 18 / 22 | 0.1 | : | 0.1 | 0.012 | - | 1.8 | 0.17 | 0.44 | 0.1 U |
| Arsenic | 2 / 22 | 0.01 | : | 0.01 | 0.0045 | - | 0.0048 | 0.0050 | | 0.01 U |
| Barium | 22 / 22 | | | | 0.015 | - | 0.15 | 0.037 | 0.05 | 0.027 |
| Cadmium | 1 / 22 | 0.001 | : | 0.001 | 0.00025 | - | 0.00025 | 0.00049 | | 0.001 U |
| Calcium | 22 / 22 | | | | 9.7 | - | 40 | 22 | 18 | 21 |
| Chromium | 1 / 22 | 0.005 | : | 0.005 | 0.00098 | - | 0.00098 | 0.0024 | 0.00077 J | 0.005 U |
| Cobalt | 5 / 22 | 0.01 | : | 0.01 | 0.0016 | - | 0.0077 | 0.0046 | | 0.01 U |
| Copper | 18 / 22 | 0.0005 | : | 0.01 | 0.00077 | - | 0.054 | 0.0048 | 0.0039 NJ | 0.0038 NJ |
| Iron | 22 / 22 | | | | 0.38 | - | 29 | 3.4 | 2 | 0.43 |
| Lead | 18 / 22 | 0.0001 | : | 0.001 | 0.00016 | - | 0.11 | 0.0065 | 0.0013 J | 0.00016 J |
| Magnesium | 22 / 22 | | | | 2 | - | 5.9 | 3.9 | 3.4 | 3.3 |
| Manganese | 22 / 22 | | | | 0.03 | - | 9.3 | 0.91 | 0.59 | 0.16 |
| Nickel | 5 / 22 | 0.01 | : | 0.01 | 0.0012 | - | 0.0072 | 0.0046 | 0.0021 J | 0.01 U |
| Potassium | 22 / 22 | | | | 1.2 | - | 3.6 | 2.4 | 2.7 J | 2.8 J |
| Sodium | 22 / 22 | | | | 29 | - | 110 | 65 | 65 | 44 |
| Thallium | 1 / 22 | 0.01 | : | 0.01 | 0.0066 | - | 0.0066 | 0.0051 | | 0.01 U |
| Vanadium | 2 / 22 | 0.01 | : | 0.01 | 0.0015 | - | 0.0037 | 0.0047818 | 0.0015 J | 0.01 UJ |
| Zinc | 10 / 22 | 0.05 | : | 0.05 | 0.0071 | - | 0.069 | 0.022 | 0.024 J | 26 |
| | | | | | | | | | | 0.05 U |
| | | | | | | | | | | 0.05 U |

Table 4.2-6
Summary of Detected Chemicals for Surface Water Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | Range of Detected Concentrations | Average of All Samples | Maple Meadow Brook Wetland Background (1) | AWQC (2) (mg/L) | OC-SW-MMB-SW/SD-10-XXX MMB-SW/SD-10 12/2/2010 | OC-SW-MMB-SW/SD-10-XXX MMB-SW/SD-10 6/6/2011 |
|-----------------------------------|------------------------|---|----------------------------------|------------------------|---|-----------------|---|--|
| Inorganics (mg/L) | | | | | | | | |
| Bromide | 2 / 22 | 0.1 : 0.1 | 0.1 - 0.12 | 0.0554545 | | | 0.1 U | 0.1 U |
| Chloride | 22 / 22 | | 48 - 220 | 122 | 140 | | 110 | 130 |
| Hardness | 22 / 22 | | 32 - 120 | 72 | 60 | | 66 | 92 |
| Nitrate as N | 15 / 22 | 0.05 : 0.05 | 0.097 - 0.6 | 0.19 | 0.49 J | | 0.39 | 0.05 U |
| Nitrogen, as Ammonia | 14 / 22 | 0.1 : 0.1 | 0.1 - 2.5 | 0.30 | 0.25 | (*) | 0.23 | 0.1 U |
| Sulfate | 22 / 22 | | 3.2 - 39 | 15.1 | 26 | | 24 | 3.2 |
| Total Organic Carbon | 22 / 22 | | 1.7 - 7.5 | 4.4 | 8.9 | | 5.3 | 4.5 |
| Total Suspended Solids | 11 / 22 | 2 : 5 | 2 - 1000 | 93 | 2 | | 2 U | 5 U |
| Specialty Compounds (mg/L) | | | | | | | | |
| Hydrazine | 1 / 22 | 0.0001 : 0.0001 | 0.00006 - 0.00006 | 0.000050 | | | 0.0001 U | 0.0001 U |
| Formaldehyde | 10 / 22 | 0.03 : 0.03 | 0.005 - 0.01 | 0.012 | | | 0.03 U | 0.03 UJ |
| Kempore (Azodicarbonamide) | 1 / 4 | 1 : 1 | 0.71 - 0.71 | 0.55 | | | | |

Notes:

(1) Background location identified for the Maple Meadow Brook Wetland is located at SDBK-004.

(2) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.
mg/L = milligram per liter

U = not detected,
value is the reporting limit
J = value is estimated
R = value is rejected
N = presumptively present

Table 4.2-6
Summary of Detected Chemicals for Surface Water Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SW-MMB-SW/SD-11-XXX MMB-SW/SD-11 12/2/2010 | OC-SW-MMB-SW/SD-11-XXX MMB-SW/SD-11 6/7/2011 | OC-SW-MMB-SW/SD-1-XXX MMB-SW/SD-1 12/1/2010 | OC-SW-MMB-SW/SD-1-XXX MMB-SW/SD-1 6/6/2011 | OC-SW-MMB-SW/SD-2-XXX MMB-SW/SD-2 12/3/2010 | OC-SW-MMB-SW/SD-2-XXX MMB-SW/SD-2 6/8/2011 | OC-SW-MMB-SW/SD-3-XXX MMB-SW/SD-3 12/3/2010 | OC-SW-MMB-SW/SD-3-XXX MMB-SW/SD-3 6/8/2011 |
|-------------------------------------|---|--|---|--|---|--|---|--|
| Volatile Organics (mg/L) | | | | | | | | |
| Carbon disulfide | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.00027 J |
| Cis-1,2-Dichloroethene | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.00062 J | 0.0002 J | 0.001 U | 0.001 U |
| Methyl Tertbutyl Ether | 0.001 U | 0.001 UJ | 0.001 U | 0.001 UJ | 0.00033 J | 0.0002 J | 0.00029 J | 0.0002 J |
| Toluene | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.00075 J |
| Trichloroethene | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0004 J | 0.001 U | 0.001 U | 0.001 U |
| Semivolatile Organics (mg/L) | | | | | | | | |
| 3 & 4 Methylphenol | 0.0045 U | 0.0045 U | 0.0045 U | 0.0045 U | 0.0045 U | 0.005 U | 0.0045 U | 0.005 U |
| Benzo(a)pyrene | 0.00018 UJ | 0.00018 U | 0.00018 U | 0.00018 U | 0.00018 U | 0.0002 U | 0.00018 UJ | 0.0002 U |
| Benzo(b)fluoranthene | 0.00027 UJ | 0.00027 U | 0.00027 U | 0.00027 UJ | 0.00027 U | 0.0003 U | 0.00027 UJ | 0.0003 U |
| Benzo(ghi)perylene | 0.00045 UJ | 0.00045 U | 0.00045 U | 0.00045 U | 0.00045 U | 0.0005 U | 0.00045 UJ | 0.0005 U |
| Benzoic Acid | 0.0045 UJ | 0.0019 J | R | 0.0045 U | 0.0045 U | 0.0022 J | 0.0045 U | 0.0021 J |
| Caprolactam | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.005 UJ | 0.0045 UJ | 0.00066 J |
| Di-n-butylphthalate | 0.0045 U | 0.0045 U | 0.00098 J | 0.0045 U | 0.00059 J | 0.005 U | 0.00056 J | 0.005 U |
| N-Nitrosodimethylamine | 0.0000019 U | 0.000019 U | 0.0000019 U | 0.00000047 J | 0.0000023 U | 0.00002 U | 0.000019 U | 0.000019 U |
| N-Nitrosodi-n-propylamine | 0.00000044 J | 0.000019 U | 0.00000078 J | 0.0000019 U | 0.0000019 U | 0.00002 U | 0.000019 U | 0.000019 U |
| Phenol | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.005 UJ | 0.0045 UJ | 0.005 UJ |
| Metals, Total (mg/L) | | | | | | | | |
| Aluminum | 0.081 J | 0.036 J | 0.092 J | 0.063 J | 0.093 J | 0.026 J | 0.22 | 0.12 |
| Arsenic | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Barium | 0.018 | 0.032 | 0.026 | 0.027 | 0.035 | 0.049 | 0.032 | 0.042 |
| Cadmium | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| Calcium | 12 | 24 | 17 | 22 | 27 | 33 | 24 | 30 |
| Chromium | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U |
| Cobalt | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Copper | 0.0034 NJ | 0.0015 | 0.0024 NJ | 0.0027 | 0.0029 NJ | 0.00077 | 0.0045 NJ | 0.0026 |
| Iron | 0.45 | 1.3 | 0.53 | 1.2 | 1.1 | 1.6 | 2.3 | 2.7 |
| Lead | 0.0014 | 0.00064 J | 0.00054 J | 0.00023 J | 0.0012 | 0.00044 J | 0.0032 | 0.0016 J |
| Magnesium | 2.3 | 4.6 | 3.4 | 3.9 | 4.3 | 5.1 | 4.1 | 5 |
| Manganese | 0.066 | 0.2 | 0.16 | 0.21 | 0.95 | 1.5 | 0.52 | 2.1 |
| Nickel | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.0012 J | 0.0072 J |
| Potassium | 1.4 J | 2.8 J | 2.9 J | 2 J | 3.1 J | 3.3 J | 3.5 J | 1.4 J |
| Sodium | 29 | 110 | 48 | 79 | 58 | 85 | 56 | 65 |
| Thallium | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Vanadium | 0.01 UJ | 0.01 U | 0.01 UJ | 0.01 U | 0.01 UJ | 0.01 U | 0.01 UJ | 0.01 U |
| Zinc | 0.019 J | 0.05 U | 0.0071 J | 0.05 U | 0.0085 J | 0.05 U | 0.012 J | 0.021 J |

Table 4.2-6
Summary of Detected Chemicals for Surface Water Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SW-MMB-SW/SD-11-XXX MMB-SW/SD-11 12/2/2010 | OC-SW-MMB-SW/SD-11-XXX MMB-SW/SD-11 6/7/2011 | OC-SW-MMB-SW/SD-1-XXX MMB-SW/SD-1 12/1/2010 | OC-SW-MMB-SW/SD-1-XXX MMB-SW/SD-1 6/6/2011 | OC-SW-MMB-SW/SD-2-XXX MMB-SW/SD-2 12/3/2010 | OC-SW-MMB-SW/SD-2-XXX MMB-SW/SD-2 6/8/2011 | OC-SW-MMB-SW/SD-3-XXX MMB-SW/SD-3 12/3/2010 | OC-SW-MMB-SW/SD-3-XXX MMB-SW/SD-3 6/8/2011 |
|-----------------------------------|---|--|---|--|---|--|---|--|
| Inorganics (mg/L) | | | | | | | | |
| Bromide | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Chloride | 48 | 220 | 100 | 140 | 120 | 160 | 120 | 150 |
| Hardness | 38 | 78 | 57 | 70 | 84 | 100 | 76 | 95 |
| Nitrate as N | 0.36 | 0.31 J | 0.12 | 0.05 U | 0.6 | 0.55 J | 0.21 | 0.05 U |
| Nitrogen, as Ammonia | 0.1 U | 0.25 | 0.18 | 0.1 U | 0.6 | 0.66 | 0.22 | 0.29 |
| Sulfate | 15 | 13 | 22 | 5.4 | 25 J | 16 | 22 | 8 |
| Total Organic Carbon | 4.7 | 2.3 | 4.8 | 4.1 | 3.8 | 1.7 | 6.9 | 3.4 |
| Total Suspended Solids | 2 | 5 U | 4 | 5 UJ | 6.4 | 5 U | 18 | 5 U |
| Specialty Compounds (mg/L) | | | | | | | | |
| Hydrazine | 0.0001 U | 0.0001 U | 0.0001 U | 0.0001 U | 0.0001 U | 0.0001 U | 0.0001 U | 0.0001 U |
| Formaldehyde | 0.0088 J | 0.03 U | 0.0068 J | 0.03 UJ | 0.005 J | 0.03 U | 0.0056 J | 0.03 U |
| Kempore (Azodicarbonamide) | | | | | 1 U | 0.71 NJ | | |

Notes:

- (1) Background location identified for the Maple Meadow Brook Wetland is located at SDBK-004.
- (2) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.
 mg/L = milligram per liter

U = not detected,
 value is the reporting limit
 J = value is estimated
 R = value is rejected
 N = presumptively present

Table 4.2-6
Summary of Detected Chemicals for Surface Water Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SW-MMB-SW/SD-4-XXX MMB-SW/SD-4 12/2/2010 | OC-SW-MMB-SW/SD-4-XXX MMB-SW/SD-4 6/6/2011 | OC-SW-MMB-SW/SD-5-XXX MMB-SW/SD-5 12/2/2010 | OC-SW-MMB-SW/SD-5-XXX MMB-SW/SD-5 6/7/2011 | OC-SW-MMB-SW/SD-6-XXX MMB-SW/SD-6 12/3/2010 | OC-SW-MMB-SW/SD-6-XXX MMB-SW/SD-6 6/8/2011 | OC-SW-MMB-SW/SD-8A-XXX MMB-SW/SD-8A 12/2/2010 |
|-------------------------------------|---|--|---|--|---|--|---|
| Volatile Organics (mg/L) | | | | | | | |
| Carbon disulfide | 0.01 U | 0.01 UJ | 0.01 U | 0.01 UJ | 0.01 U | 0.00029 J | 0.01 U |
| Cis-1,2-Dichloroethene | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| Methyl Tertbutyl Ether | 0.001 U | 0.001 UJ | 0.001 U | 0.001 UJ | 0.001 U | 0.001 UJ | 0.001 U |
| Toluene | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0004 J | 0.001 U |
| Trichloroethene | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| Semivolatile Organics (mg/L) | | | | | | | |
| 3 & 4 Methylphenol | 0.0045 U | 0.0045 U | 0.0045 U | 0.0045 U | 0.0045 U | 0.00074 J | 0.0045 U |
| Benzo(a)pyrene | 0.00018 U | 0.00018 U | 0.00018 U | 0.00018 U | 0.000096 J | 0.0002 U | 0.00018 U |
| Benzo(b)fluoranthene | 0.00027 U | 0.00027 UJ | 0.00027 U | 0.00027 UJ | 0.00013 J | 0.0003 U | 0.00027 U |
| Benzo(ghi)perylene | 0.00045 U | 0.00045 U | 0.00045 U | 0.00045 U | 0.000089 J | 0.0005 U | 0.00045 U |
| Benzoic Acid | 0.0045 UJ | 0.0019 J | 0.0045 UJ | 0.002 J | 0.0045 U | 0.0024 J | 0.0045 UJ |
| Caprolactam | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.005 UJ | 0.0045 UJ |
| Di-n-butylphthalate | 0.0045 U | 0.0045 U | 0.0045 U | 0.0045 U | 0.00057 J | 0.005 U | 0.0045 U |
| N-Nitrosodimethylamine | 0.0000019 U | 0.0000019 U | 0.0000019 U | 0.0000019 U | 0.0000019 U | 0.000038 U | 0.0000019 U |
| N-Nitrosodi-n-propylamine | 0.0000019 U | 0.0000019 U | 0.000002 U | 0.0000019 U | 0.0000019 U | 0.000038 U | 0.00000066 J |
| Phenol | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.00083 J | 0.0045 UJ |
| Metals, Total (mg/L) | | | | | | | |
| Aluminum | 0.017 J | 0.1 U | 0.083 J | 0.11 | 1.8 | 0.48 | 0.077 J |
| Arsenic | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.0045 J | 0.0048 J | 0.01 U |
| Barium | 0.022 | 0.025 | 0.018 | 0.04 | 0.065 | 0.15 | 0.015 |
| Cadmium | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.00025 J | 0.001 U | 0.001 U |
| Calcium | 18 | 22 | 13 | 22 | 23 | 40 | 9.7 |
| Chromium | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.00098 J | 0.005 U |
| Cobalt | 0.01 U | 0.01 U | 0.01 U | 0.0022 J | 0.0023 J | 0.0077 J | 0.01 U |
| Copper | 0.0031 NJ | 0.0005 U | 0.0024 NJ | 0.0018 | 0.0083 NJ | 0.054 | 0.01 U |
| Iron | 0.46 | 0.88 | 0.49 | 1.9 | 20 | 29 | 0.48 |
| Lead | 0.00058 J | 0.0001 U | 0.0014 | 0.0014 J | 0.014 | 0.11 | 0.0016 |
| Magnesium | 3.5 | 3.9 | 2.6 | 4.2 | 3.6 | 5.9 | 2 |
| Manganese | 0.13 | 0.14 | 0.034 | 1.2 | 1.2 | 9.3 | 0.03 |
| Nickel | 0.01 U | 0.01 U | 0.01 U | 0.0013 J | 0.0032 J | 0.0043 J | 0.01 U |
| Potassium | 2.6 J | 2.3 J | 2.2 J | 2.1 J | 2 J | 3.6 J | 1.2 J |
| Sodium | 53 | 80 | 44 | 93 | 37 | 45 | 30 |
| Thallium | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.0066 J | 0.01 U |
| Vanadium | 0.01 UJ | 0.01 U | 0.01 UJ | 0.01 U | 0.0037 J | 0.0015 J | 0.01 UJ |
| Zinc | 0.05 U | 0.05 U | 0.011 J | 0.05 U | 0.069 | 0.027 J | 0.0093 J |

Table 4.2-6
Summary of Detected Chemicals for Surface Water Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SW-MMB-SW/SD-4-XXX MMB-SW/SD-4 12/2/2010 | OC-SW-MMB-SW/SD-4-XXX MMB-SW/SD-4 6/6/2011 | OC-SW-MMB-SW/SD-5-XXX MMB-SW/SD-5 12/2/2010 | OC-SW-MMB-SW/SD-5-XXX MMB-SW/SD-5 6/7/2011 | OC-SW-MMB-SW/SD-6-XXX MMB-SW/SD-6 12/3/2010 | OC-SW-MMB-SW/SD-6-XXX MMB-SW/SD-6 6/8/2011 | OC-SW-MMB-SW/SD-8A-XXX MMB-SW/SD-8A 12/2/2010 |
|-----------------------------------|---|--|---|--|---|--|---|
| Inorganics (mg/L) | | | | | | | |
| Bromide | 0.1 U | 0.1 U | 0.1 U | 0.1 | 0.1 U | 0.1 U | 0.1 U |
| Chloride | 100 | 130 | 79 | 160 | 76 | 76 | 49 |
| Hardness | 59 | 70 | 43 | 72 | 73 | 120 | 32 |
| Nitrate as N | 0.11 | 0.05 U | 0.24 | 0.05 U | 0.24 | 0.05 UJ | 0.31 |
| Nitrogen, as Ammonia | 0.16 | 0.1 U | 0.1 U | 0.1 | 0.48 | 2.5 | 0.1 U |
| Sulfate | 19 | 7.1 | 15 | 5.7 | 20 | 39 | 12 |
| Total Organic Carbon | 4.5 | 4.8 | 3.6 | 3.7 | 6.7 | 7.5 | 4.9 |
| Total Suspended Solids | 2 U | 6 | 4 | 10 | 930 | 1000 | 2 U |
| Specialty Compounds (mg/L) | | | | | | | |
| Hydrazine | 0.0001 U | 0.0001 U | 0.0001 U | 0.0001 U | 0.0001 U | 0.0001 U | 0.0001 U |
| Formaldehyde | 0.01 J | 0.03 U | 0.0084 J | 0.03 U | 0.0051 J | 0.03 U | 0.0071 J |
| Kempore (Azodicarbonamide) | | | 1 U | 1 U | | | |

Notes:

(1) Background location identified for the Maple Meadow Brook Wetland is located at SDBK-004.

(2) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.
mg/L = milligram per liter

U = not detected,
value is the reporting limit
J = value is estimated
R = value is rejected
N = presumptively present

Table 4.2-6
Summary of Detected Chemicals for Surface Water Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SW-MMB-SW/SD-8A-XXX MMB-SW/SD-8A 6/7/2011 | OC-SW-MMB-SW/SD-8A-XXX MMB-SW/SD-8A 6/8/2011 | OC-SW-MMB-SW/SD-8-XXX MMB-SW/SD-8 12/2/2010 | OC-SW-MMB-SW/SD-8-XXX MMB-SW/SD-8 6/7/2011 | OC-SW-MMB-SW/SD-9-XXX MMB-SW/SD-9 12/1/2010 | OC-SW-MMB-SW/SD-9-XXX MMB-SW/SD-9 6/6/2011 |
|-------------------------------------|--|--|---|--|---|--|
| Volatile Organics (mg/L) | | | | | | |
| Carbon disulfide | | 0.00028 J | 0.01 U | 0.01 UJ | 0.01 U | 0.01 U |
| Cis-1,2-Dichloroethene | | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| Methyl Tertbutyl Ether | | 0.001 UJ | 0.001 U | 0.001 UJ | 0.001 U | 0.001 UJ |
| Toluene | | 0.00034 J | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| Trichloroethene | | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| Semivolatile Organics (mg/L) | | | | | | |
| 3 & 4 Methylphenol | | 0.005 U | 0.0045 U | 0.0045 U | 0.0045 U | 0.0045 U |
| Benzo(a)pyrene | | 0.0002 U | 0.00018 U | 0.00018 U | 0.00018 U | 0.00013 J |
| Benzo(b)fluoranthene | | 0.0003 U | 0.00027 U | 0.00027 U | 0.00027 U | 0.00027 UJ |
| Benzo(ghi)perylene | | 0.0005 U | 0.00045 U | 0.00045 U | 0.00045 U | 0.00045 U |
| Benzoic Acid | | 0.0021 J | 0.0045 UJ | 0.0019 J | R | 0.0019 J |
| Caprolactam | | 0.00066 J | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ |
| Di-n-butylphthalate | | 0.005 U | 0.0045 U | 0.0045 U | 0.00078 J | 0.0045 U |
| N-Nitrosodimethylamine | | 0.000019 U | 0.0000019 U | 0.000019 U | 0.0000019 U | 0.0000019 U |
| N-Nitrosodi-n-propylamine | | 0.000019 U | 0.0000019 U | 0.000019 U | 0.0000019 U | 0.0000019 UJ |
| Phenol | | 0.005 UJ | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ | 0.0045 UJ |
| Metals, Total (mg/L) | | | | | | |
| Aluminum | | 0.14 | 0.04 J | 0.035 J | 0.012 J | 0.1 U |
| Arsenic | | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Barium | | 0.042 | 0.02 | 0.044 | 0.025 | 0.022 |
| Cadmium | | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| Calcium | | 24 | 12 | 25 | 21 | 24 |
| Chromium | | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U |
| Cobalt | | 0.0016 J | 0.01 U | 0.0021 J | 0.01 U | 0.01 U |
| Copper | 0.0012 | | 0.0025 NJ | 0.00083 | 0.0016 NJ | 0.0005 U |
| Iron | | 3.3 | 0.38 | 2.8 | 0.45 | 2.2 |
| Lead | 0.0015 J | | 0.0017 | 0.00042 J | 0.001 U | 0.0001 U |
| Magnesium | | 4.7 | 2.5 | 4.8 | 3.7 | 4.1 |
| Manganese | | 0.57 | 0.046 | 0.83 | 0.16 | 0.17 |
| Nickel | | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Potassium | | 2.5 J | 1.8 J | 2.6 J | 3.1 J | 1.9 J |
| Sodium | | 110 | 44 | 110 | 54 | 76 |
| Thallium | | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Vanadium | | 0.01 U | 0.01 UJ | 0.01 U | 0.01 UJ | 0.01 U |
| Zinc | | 0.05 U | 0.011 J | 0.05 U | 0.05 U | 0.05 U |

Table 4.2-6
Summary of Detected Chemicals for Surface Water Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SW-MMB-SW/SD-8A-XXX MMB-SW/SD-8A 6/7/2011 | OC-SW-MMB-SW/SD-8A-XXX MMB-SW/SD-8A 6/8/2011 | OC-SW-MMB-SW/SD-8-XXX MMB-SW/SD-8 12/2/2010 | OC-SW-MMB-SW/SD-8-XXX MMB-SW/SD-8 6/7/2011 | OC-SW-MMB-SW/SD-9-XXX MMB-SW/SD-9 12/1/2010 | OC-SW-MMB-SW/SD-9-XXX MMB-SW/SD-9 6/6/2011 |
|-----------------------------------|--|--|---|--|---|--|
| Inorganics (mg/L) | | | | | | |
| Bromide | | 0.1 U | 0.1 U | 0.12 | 0.1 U | 0.1 U |
| Chloride | | 210 | 90 | 180 | 100 | 130 |
| Hardness | | 80 | 41 | 83 | 67 | 77 |
| Nitrate as N | | 0.15 J | 0.22 | 0.097 | 0.12 | 0.05 U |
| Nitrogen, as Ammonia | | 0.15 | 0.1 U | 0.16 | 0.23 | 0.1 U |
| Sulfate | | 11 | 16 | 8.7 | 21 | 3.9 |
| Total Organic Carbon | | 2.9 | 4.3 | 2.7 | 4.5 | 5.1 |
| Total Suspended Solids | | 40 | 2.5 U | 6 | 2 U | 5 UJ |
| Specialty Compounds (mg/L) | | | | | | |
| Hydrazine | 0.0001 U | | 0.0001 U | 0.00006 J | 0.0001 U | 0.0001 U |
| Formaldehyde | | 0.03 U | 0.0091 J | 0.03 U | 0.0093 J | 0.03 U |
| Kempore (Azodicarbonamide) | | | | | | |

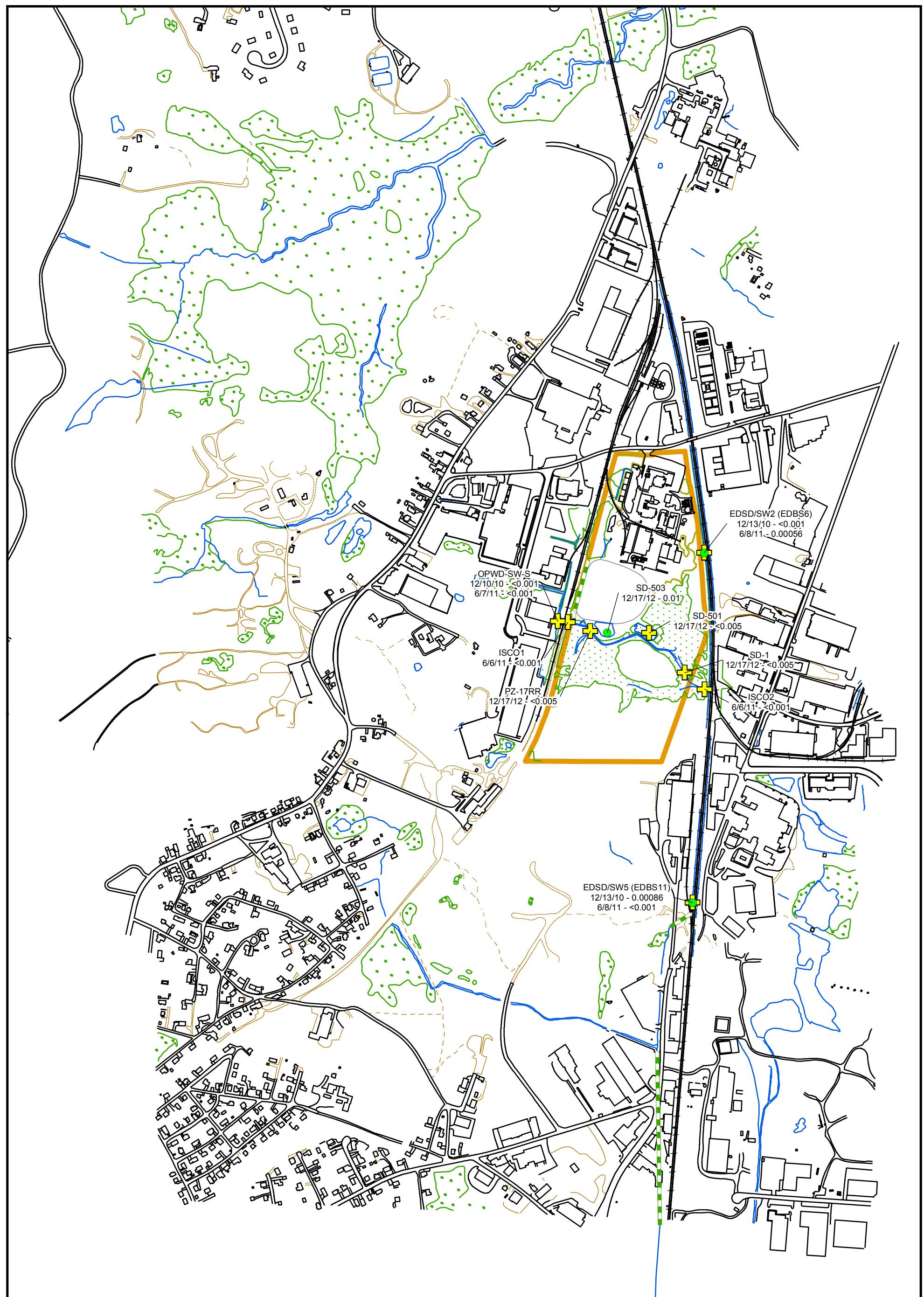
Notes:

- (1) Background location identified for the Maple Meadow Brook Wetland is located at SDBK-004.
- (2) USEPA, Freshwater Ambient Water Quality Criteria (AWQC) (USEPA, 2013).

(*) - Freshwater criteria are pH, temperature, and life-stage dependent.
 mg/L = milligram per liter

U = not detected,
 value is the reporting limit
 J = value is estimated
 R = value is rejected
 N = presumptively present

Prepared by / Date: KJC 03/04/14
 Checked by / Date: CTM 03/10/14



Legend

- MMB-SW/SD-4 Location ID
- 0.05 Analyte Concentration (mg/L)
- ✚ Analyte Not Detected (ND)
- 51 Eames St. Property Boundary
- Paved Road
- Unpaved Road
- Railroad
- Sidewalks
- Structures
- Surface Water
- Trails
- Wetland Boundary
- Wooded Areas
- Culvert



AMEC Environment & Infrastructure
271 Mill Road
Chelmsford, MA 01824



0 340 680 1,360
Feet

Figure 4.1-33
Distribution of Surface Water Concentrations for Hexavalent Chromium
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 03/12/14 Checked/Date: CTM 03/12/14

ATTACHMENT C
HEXAVALENT CHROMIUM DATA AND FIGURE
SEDIMENT
FROM JULY 2015 OU1 AND OU2 REMEDIAL INVESTIGATION REPORT

Table 4.1-7
Summary of Detected Chemicals for Sediment Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | | Average of All Samples | OC-SD-ISCO-2-XXX 12/9/2010 0-0.5 ft | OC-SD-ISCO-2-XXX 2/17/2011 ISCO2 | OC-SD-SD-1-XXX 12/9/2010 0-0.5 ft | OC-SD-SD2-0.0/0.5 SD-SD2 11/11/2011 0-0.5 ft | OC-SD-SD2-SD-SD2 11/16/2012 0-0.5 ft |
|--------------------------------------|------------------------|---|---|----------------------------------|--------|------------------------|---|--|---|---|--|
| Volatile Organics (mg/Kg) | | | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | 3 / 6 | 0.0046 | : | 0.0075 | 0.0096 | - 0.037 | 0.013 | 0.0096 | 0.02 | 0.0075 U | |
| 2,4,4-Trimethyl-2-pentene | 2 / 6 | 0.0046 | : | 0.0078 | 0.0028 | - 0.0035 | 0.0033 | 0.0035 J | 0.0078 U | 0.0075 U | |
| 2-Butanone | 3 / 6 | 0.023 | : | 0.037 | 0.02 | - 0.038 | 0.023 | 0.032 J | 0.038 J | 0.037 U | |
| 4-iso-Propyltoluene | 1 / 6 | 0.0023 | : | 0.004 | 0.0026 | - 0.0026 | 0.0019 | 0.004 U | 0.0039 U | 0.0037 U | |
| Acetone | 1 / 6 | 0.23 | : | 0.4 | 0.12 | - 0.12 | 0.16 | 0.4 UJ | 0.12 J * | 0.37 UJ | |
| Cis-1,2-Dichloroethene | 1 / 6 | 0.0023 | : | 0.0039 | 0.0024 | - 0.0024 | 0.0018 | 0.0024 J | 0.0039 U | 0.0037 U | |
| trans-1,2-Dichloroethene | 1 / 6 | 0.0023 | : | 0.0039 | 0.0045 | - 0.0045 | 0.0021 | 0.0045 | 0.0039 U | 0.0037 U | |
| Semivolatile Organics (mg/Kg) | | | | | | | | | | | |
| 1,3-Dichlorobenzene | 1 / 5 | 0.21 | : | 0.31 | 0.039 | - 0.039 | 0.11 | 0.31 U | 5.4 U | 0.29 U | |
| 3 & 4 Methylphenol | 3 / 6 | 0.29 | : | 5.4 | 0.61 | - 3 | 1.4 | 0.31 U | 5.4 U | 0.29 U | |
| Acetophenone | 1 / 6 | 0.21 | : | 5.4 | 0.09 | - 0.09 | 0.55 | 0.31 U | 5.4 U | 0.29 U | |
| Aniline | 1 / 6 | 0.055 | : | 5.4 | 0.23 | - 0.23 | 0.55 | 0.23 J | 5.4 U * | 0.29 U | |
| Anthracene | 1 / 6 | 0.21 | : | 5.4 | 0.018 | - 0.018 | 0.54 | 0.31 U | 5.4 U | 0.29 U | |
| Benzaldehyde | 4 / 6 | 0.29 | : | 5.4 | 0.12 | - 0.62 | 0.71 | 0.12 J | 5.4 U | 0.29 U | |
| Benzo(a)anthracene | 2 / 6 | 0.21 | : | 5.4 | 0.06 | - 0.12 | 0.55 | 0.31 U | 5.4 U | 0.29 U | |
| Benzo(a)pyrene | 3 / 6 | 0.29 | : | 5.4 | 0.046 | - 0.13 | 0.55 | 0.31 U | 5.4 U | 0.29 U | |
| Benzo(b)fluoranthene | 3 / 6 | 0.29 | : | 5.4 | 0.075 | - 0.16 | 0.55 | 0.31 U | 5.4 U | 0.29 U | |
| Benzo(ghi)perylene | 3 / 6 | 0.29 | : | 5.4 | 0.054 | - 0.096 | 0.54 | 0.31 U | 5.4 U | 0.29 U | |
| Benzo(k)fluoranthene | 2 / 6 | 0.21 | : | 5.4 | 0.083 | - 0.087 | 0.55 | 0.31 U | 5.4 U | 0.29 U | |
| Benzoic Acid | 3 / 6 | 1.1 | : | 27 | 0.047 | - 0.43 | 2.6 | 0.43 J | 27 U | 1.4 U | |
| Benzyl alcohol | 1 / 6 | 0.43 | : | 11 | 0.071 | - 0.071 | 1.1 | 0.62 U | 11 U | 0.58 U | |
| Biphenyl | 2 / 6 | 0.21 | : | 5.4 | 0.016 | - 0.32 | 0.57 | 0.32 | 5.4 U | 0.29 U | |
| Bis(2-Ethylhexyl)phthalate | 6 / 6 | | | | 0.27 | - 480 | 162 | 280 | 480 | 210 | |
| Caprolactam | 1 / 5 | 0.21 | : | 0.31 | 0.053 | - 0.053 | 0.11 | 0.31 UJ | 5.4 U | 0.29 UJ | |
| Chrysene | 3 / 6 | 0.29 | : | 5.4 | 0.06 | - 0.14 | 0.54 | 0.31 U | 5.4 U | 0.29 U | |
| Dibenz(a,h)anthracene | 1 / 6 | 0.21 | : | 5.4 | 0.031 | - 0.031 | 0.54 | 0.31 U | 5.4 U | 0.29 U | |
| Di-n-octylphthalate | 1 / 6 | 0.055 | : | 5.4 | 0.15 | - 0.15 | 0.54 | 0.31 U | 5.4 U | 0.15 J | |
| Diphenyl ether | 3 / 6 | 0.21 | : | 5.4 | 0.19 | - 2.6 | 0.99 | 2.6 | 5.4 U | 0.22 J | |
| Diphenylamine | 1 / 5 | 0.055 | : | 0.22 | 0.095 | - 0.095 | 0.073 | 0.095 | | 0.058 U | |
| Diphenylmethanone | 1 / 6 | 0.21 | : | 5.4 | 0.03 | - 0.03 | 0.54 | 0.31 U | 5.4 U | 0.29 U | |
| Fluoranthene | 3 / 6 | 0.29 | : | 5.4 | 0.11 | - 0.3 | 0.59 | 0.31 U | 5.4 U | 0.29 U | |
| Indeno(1,2,3-cd)pyrene | 3 / 6 | 0.29 | : | 5.4 | 0.059 | - 0.087 | 0.54 | 0.31 U | 5.4 U | 0.29 U | |
| N-Nitrosodiphenylamine | 3 / 6 | 0.21 | : | 5.4 | 0.065 | - 1.6 | 0.81 | 1.6 | 5.4 U | 0.065 | |
| Phenanthrene | 2 / 6 | 0.25 | : | 6.4 | 0.071 | - 0.16 | 0.65 | 0.37 U | 6.4 U | 0.35 U | |
| Phenol | 4 / 6 | 0.29 | : | 5.4 | 0.13 | - 1.1 | 0.87 | 0.13 J | 5.4 U | 0.29 U | |
| Pyrene | 3 / 6 | 0.29 | : | 5.4 | 0.11 | - 0.25 | 0.58 | 0.31 U | 5.4 U | 0.29 U | |

Table 4.1-7
Summary of Detected Chemicals for Sediment Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | Frequency of Detection | Range of Reporting Limits for Non Detects | Range of Detected Concentrations | Average of All Samples | OC-SD-ISCO-2-XXX 12/9/2010 0-0.5 ft | OC-SD-ISCO-2-XXX 2/17/2011 ISCO2 | OC-SD-SD-1-XXX 12/9/2010 0-0.5 ft | OC-SD-SD2-0.0/0.5 SD-SD2 11/11/2011 0-0.5 ft | OC-SD-SD2-SD-SD2 11/16/2012 0-0.5 ft |
|---|------------------------|---|----------------------------------|------------------------|---|--|---|---|--|
| Inorganics (mg/Kg) | | | | | | | | | |
| Aluminum | 15 / 15 | | 4500 - 11000 | 8853 | 10000 | 8100 | 7900 | 11000 J | 5100 J |
| Arsenic | 6 / 6 | | 3.2 - 11 | 6.2 | 6.2 | 6.7 | 5 | | |
| Barium | 6 / 6 | | 11 - 45 | 22 | 11 J | 14 | 12 J | | |
| Beryllium | 6 / 6 | | 0.21 - 1.3 | 0.66 | 1.3 | 0.77 | 1 | | |
| Cadmium | 6 / 6 | | 0.16 - 1.2 | 0.47 | 1.2 | 0.58 | 0.32 J | | |
| Calcium | 6 / 6 | | 820 - 4700 | 1875 | 1300 | 1100 B | 820 J | | |
| Chromium | 15 / 15 | | 29 - 3000 | 610 | 2500 | 3000 | 1800 | 130 | 430 |
| Chromium, Hexavalent | 3 / 5 | 2.6 : 3.3 | 2.6 - 28 | 11.7 | 28 | | 25 | | |
| Cobalt | 6 / 6 | | 3.9 - 21 | 9.4 | 21 | 17 | 4.7 | | |
| Copper | 6 / 6 | | 17 - 24 | 20 | 21 | 20 | 17 | | |
| Iron | 15 / 15 | | 4300 - 17000 | 10680 | 4700 | 4300 B | 4400 | 14000 J | 6200 |
| Lead | 6 / 6 | | 9.4 - 35 | 19.6 | 11 | 11 | 9.4 | | |
| Magnesium | 6 / 6 | | 410 - 2700 | 1193 | 480 J | 410 B | 470 J | | |
| Manganese | 6 / 6 | | 38 - 280 | 127 | 67 J | 49 B | 38 J | | |
| Mercury | 2 / 6 | 0.1 : 0.12 | 0.22 - 0.24 | 0.11 | 0.24 | 0.22 B | 0.12 U | | |
| Nickel | 6 / 6 | | 8.4 - 24 | 13.5 | 24 | 17 | 11 | | |
| Potassium | 6 / 6 | | 680 - 1700 | 1198 | 1700 | 1500 | 1400 | | |
| Selenium | 1 / 6 | 0.68 : 0.91 | 0.72 - 0.72 | 0.46 | 0.72 J | 0.89 U | 0.91 U | | |
| Silver | 6 / 6 | | 1.6 - 62 | 26 | 51 | 62 ^ | 35 | | |
| Sodium | 6 / 6 | | 65 - 160 | 102 | 95 J | 110 J | 160 J | | |
| Vanadium | 6 / 6 | | 8 - 20 | 11.7 | 9.4 | 8 | 8.5 | | |
| Zinc | 6 / 6 | | 30 - 65 | 45 | 45 J | 30 | 33 J | | |
| Chloride | 6 / 6 | | 38 - 140 | 92 | 130 | 130 | 140 | | |
| Nitrogen, as Ammonia | 6 / 6 | | 130 - 290 | 208 | 290 J | 170 | 240 J | | |
| Oxidation Reduction Potential (mV) | 6 / 6 | | 97 - 360 | 198 | 200 | | 360 | | |
| pH (pH units) | 6 / 6 | | 5.83 - 7.66 | 7.1 | 6.88 HF | | 5.83 HF | | |
| Sulfate | 6 / 6 | | 210 - 830 | 557 | 600 | 830 | 640 | | |
| Total Organic Carbon | 6 / 6 | | 7500 - 52000 | 35250 | 52000 | 44000 | 48000 | | |
| EPH (mg/Kg) | | | | | | | | | |
| C11-C22 Aromatics | 5 / 5 | | 11 - 9400 | 2110 | 9400 | | 1100 | | |
| C11-C22 Aromatics (unadj.) | 5 / 5 | | 11 - 9400 | 2110 | 9400 | | 1100 | | |
| C19-C36 Aliphatics | 5 / 5 | | 14 - 6400 | 1435 | 6400 | | 690 | | |
| C9-C18 Aliphatics | 2 / 5 | 4.2 : 5.4 | 96 - 770 | 175 | 770 | | 96 | | |
| Extractable Petroleum Hydrocarbons, Total | 5 / 5 | | 25 - 17000 | 3808 | 17000 | | 1900 | | |

Table 4.1-7
Summary of Detected Chemicals for Sediment Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | Average of All Samples | OC-SD-ISCO-2-XXX 12/9/2010 0-0.5 ft | OC-SD-ISCO-2-XXX 2/17/2011 ISCO2 0-0.5 ft | OC-SD-SD-1-XXX 12/9/2010 SD-1 0-0.5 ft | OC-SD-SD2-0.0/0.5 SD-SD2 11/11/2011 0-0.5 ft | OC-SD-SD2-SD-SD2 11/16/2012 0-0.5 ft |
|------------------------------------|------------------------|---|---|----------------------------------|------------------------|---|--|---|---|--|
| Specialty Compounds (mg/Kg) | | | | | | | | | | |
| Hydrazine | 3 / 5 | 0.0029 | : | 0.0029 | 0.00091 - 0.0024 | 0.0015 | 0.0024 J | | 0.0013 J | |
| Acetaldehyde | 3 / 5 | 0.26 | : | 0.33 | 0.052 - 0.076 | 0.097 | 0.063 J | | 0.33 U | |
| Formaldehyde | 5 / 5 | | | | 0.27 - 0.98 | 0.55 | 0.6 | | 0.27 | |
| Dimethylformamide | 1 / 5 | 0.11 | : | 0.18 | 0.3 - 0.3 | 0.12 | 0.14 U | | 0.18 U | |

mg/Kg = milligram per kilogram

mV = millivolts

U = not detected,

value is the reporting limit

J = value is estimated

JEB = value is estimated, analyte detected in an equipment blank

B = compound was found in the blank and sample

* = LCS or LCSD exceeds the control limits

^ = ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related

QC exceeds the control limits.

HF = holding time exceeded

Table 4.1-7
Summary of Detected Chemicals for Sediment Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | OC-SD-SD2 SD-SD2 11/21/2013 0-0.5 ft | OC-SD-SD3- 0.0/0.5 SD-SD3 11/11/2011 0-0.5 ft | OC-SD-SD3 SD-SD3 11/16/2012 0-0.5 ft | OC-SD-SD3 SD-SD3 11/21/2013 0-0.5 ft | OC-SD-SD5- 0.0/0.5 SD-SD5 11/11/2011 0-0.5 ft | OC-SD-SD5 SD-SD5 11/16/2012 0-0.5 ft | OC-SD-SD5 SD-SD5 11/21/2013 0-0.5 ft | OC-SD-SD- SD2-XXX SD-SD2 12/10/2010 0-0.5 ft | OC-SD-SD-SD3- XXX SD- SD3 12/9/2010 0-0.5 ft | OC-SD-SDSW- E-XXX SDSW-E 12/9/2010 0-0.5 ft |
|--------------------------------------|---|---|---|---|---|---|---|--|---|---|
| Volatile Organics (mg/Kg) | | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | 0.037 J | 0.0066 U | 0.0046 U |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | 0.0028 J | 0.0066 U | 0.0046 U |
| 2-Butanone | | | | | | | | 0.02 J | 0.033 U | 0.023 U |
| 4-iso-Propyltoluene | | | | | | | | 0.0034 UJ | 0.0026 J | 0.0023 U |
| Acetone | | | | | | | | 0.34 UJ | 0.33 UJ | 0.23 UJ |
| Cis-1,2-Dichloroethene | | | | | | | | 0.0034 UJ | 0.0033 U | 0.0023 U |
| trans-1,2-Dichloroethene | | | | | | | | 0.0034 UJ | 0.0033 U | 0.0023 U |
| Semivolatile Organics (mg/Kg) | | | | | | | | | | |
| 1,3-Dichlorobenzene | | | | | | | | 0.039 J | 0.22 U | 0.21 U |
| 3 & 4 Methylphenol | | | | | | | | 2 | 3 | 0.61 |
| Acetophenone | | | | | | | | 0.09 | 0.22 U | 0.21 U |
| Aniline | | | | | | | | 0.055 UJ | 0.22 U | 0.21 U |
| Anthracene | | | | | | | | 0.018 J | 0.22 U | 0.21 U |
| Benzaldehyde | | | | | | | | 0.48 | 0.62 | 0.2 J |
| Benzo(a)anthracene | | | | | | | | 0.06 | 0.12 J | 0.21 U |
| Benzo(a)pyrene | | | | | | | | 0.046 J | 0.13 J | 0.11 J |
| Benzo(b)fluoranthene | | | | | | | | 0.075 | 0.16 J | 0.093 J |
| Benzo(ghi)perylene | | | | | | | | 0.054 J | 0.096 J | 0.073 J |
| Benzo(k)fluoranthene | | | | | | | | 0.083 | 0.087 J | 0.21 U |
| Benzoic Acid | | | | | | | | 0.047 J | 0.22 J | 1.1 U |
| Benzyl alcohol | | | | | | | | 0.071 J | 0.44 U | 0.43 U |
| Biphenyl | | | | | | | | 0.016 J | 0.22 U | 0.21 U |
| Bis(2-Ethylhexyl)phthalate | | | | | | | | 0.49 J | 0.27 | 0.72 |
| Caprolactam | | | | | | | | 0.053 J | 0.22 UJ | 0.21 UJ |
| Chrysene | | | | | | | | 0.06 | 0.14 J | 0.068 J |
| Dibenz(a,h)anthracene | | | | | | | | 0.031 J | 0.22 U | 0.21 U |
| Di-n-octylphthalate | | | | | | | | 0.055 U | 0.22 U | 0.21 U |
| Diphenyl ether | | | | | | | | 0.19 | 0.22 U | 0.21 U |
| Diphenylamine | | | | | | | | 0.055 U | 0.22 U | 0.21 U |
| Diphenylmethanone | | | | | | | | 0.03 J | 0.22 U | 0.21 U |
| Fluoranthene | | | | | | | | 0.11 | 0.3 | 0.12 J |
| Indeno(1,2,3-cd)pyrene | | | | | | | | 0.059 | 0.087 J | 0.077 J |
| N-Nitrosodiphenylamine | | | | | | | | 0.28 | 0.22 U | 0.21 U |
| Phenanthrene | | | | | | | | 0.071 | 0.16 J | 0.25 U |
| Phenol | | | | | | | | 1.1 J | 0.92 | 0.22 |
| Pyrene | | | | | | | | 0.11 | 0.25 | 0.12 J |

Table 4.1-7
Summary of Detected Chemicals for Sediment Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | OC-SD-SD2 SD-SD2 11/21/2013 0-0.5 ft | OC-SD-SD3- 0.0/0.5 SD-SD3 11/11/2011 0-0.5 ft | OC-SD-SD3- SD-SD3 11/16/2012 0-0.5 ft | OC-SD-SD3- SD-SD3 11/21/2013 0-0.5 ft | OC-SD-SD5- 0.0/0.5 SD-SD5 11/11/2011 0-0.5 ft | OC-SD-SD5 SD-SD5 11/16/2012 0-0.5 ft | OC-SD-SD5 SD-SD5 11/21/2013 0-0.5 ft | OC-SD-SD- SD2-XXX SD-SD2 12/10/2010 0-0.5 ft | OC-SD-SD-SD3- XXX SD- SD3 12/9/2010 0-0.5 ft | OC-SD-SDSW- E-XXX SDSW-E 12/9/2010 0-0.5 ft |
|---|---|---|--|--|---|---|---|--|---|---|
| Inorganics (mg/Kg) | | | | | | | | | | |
| Aluminum | 9700 | 9700 J | 6600 J | 11000 | 11000 J | 11000 J | 8600 | 11000 | 7600 | 4500 |
| Arsenic | | | | | | | | 11 | 5.3 | 3.2 |
| Barium | | | | | | | | 45 J | 33 J | 14 J |
| Beryllium | | | | | | | | 0.36 | 0.3 | 0.21 J |
| Cadmium | | | | | | | | 0.31 J | 0.25 J | 0.16 J |
| Calcium | | | | | | | | 4700 J | 2400 J | 930 J |
| Chromium | 94 | 35 | 41 | 29 | 59 | 460 | 99 | 240 | 130 | 100 |
| Chromium, Hexavalent | | | | | | | | 3.3 U | 2.6 U | 2.6 |
| Cobalt | | | | | | | | 5.3 | 3.9 | 4.4 |
| Copper | | | | | | | | 24 | 21 | 19 |
| Iron | 12000 | 14000 J | 9600 | 17000 | 15000 J | 14000 | 11000 | 16000 | 11000 | 7000 |
| Lead | | | | | | | | 35 | 31 | 20 |
| Magnesium | | | | | | | | 2700 J | 1900 J | 1200 J |
| Manganese | | | | | | | | 280 J | 250 J | 80 J |
| Mercury | | | | | | | | 0.1 U | 0.11 U | 0.11 U |
| Nickel | | | | | | | | 11 | 9.3 | 8.4 |
| Potassium | | | | | | | | 1000 | 910 | 680 |
| Selenium | | | | | | | | 0.91 U | 0.69 U | 0.68 U |
| Silver | | | | | | | | 4.1 | 2 | 1.6 |
| Sodium | | | | | | | | 100 J | 82 J | 65 J |
| Vanadium | | | | | | | | 20 | 15 | 9.2 |
| Zinc | | | | | | | | 65 J | 60 J | 35 J |
| Chloride | | | | | | | | 38 | 64 | 52 |
| Nitrogen, as Ammonia | | | | | | | | 250 J | 170 J | 130 J |
| Oxidation Reduction Potential (mV) | | | | | | | | 100 | 150 | 280 |
| pH (pH units) | | | | | | | | 7.66 HF | 7.51 HF | 6.82 HF |
| Sulfate | | | | | | | | 700 | 360 | 210 |
| Total Organic Carbon | | | | | | | | 30000 | 30000 | 7500 |
| EPH (mg/Kg) | | | | | | | | | | |
| C11-C22 Aromatics | | | | | | | | | 17 | 24 |
| C11-C22 Aromatics (unadj.) | | | | | | | | | 17 | 24 |
| C19-C36 Aliphatics | | | | | | | | | 29 | 43 |
| C9-C18 Aliphatics | | | | | | | | | 5.4 U | 4.4 U |
| Extractable Petroleum Hydrocarbons, Total | | | | | | | | | 46 | 67 |
| | | | | | | | | | | 25 |

Table 4.1-7
Summary of Detected Chemicals for Sediment Samples - South Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | OC-SD-SD2 SD-SD2 11/21/2013 0-0.5 ft | OC-SD-SD3- 0.0/0.5 SD-SD3 11/11/2011 0-0.5 ft | OC-SD-SD3 SD-SD3 11/16/2012 0-0.5 ft | OC-SD-SD3 SD-SD3 11/21/2013 0-0.5 ft | OC-SD-SD5- 0.0/0.5 SD-SD5 11/11/2011 0-0.5 ft | OC-SD-SD5 SD-SD5 11/16/2012 0-0.5 ft | OC-SD-SD5 SD-SD5 11/21/2013 0-0.5 ft | OC-SD-SD- SD2-XXX SD-SD2 12/10/2010 0-0.5 ft | OC-SD-SD-SD3- XXX SD- SD3 12/9/2010 0-0.5 ft | OC-SD-SDSW- E-XXX SDSW-E 12/9/2010 0-0.5 ft |
|------------------------------------|---|---|---|---|---|---|---|--|---|---|
| Specialty Compounds (mg/Kg) | | | | | | | | | | |
| Hydrazine | | | | | | | | | 0.00091 J | 0.0029 U |
| Acetaldehyde | | | | | | | | | 0.076 J | 0.052 J |
| Formaldehyde | | | | | | | | | 0.98 J | 0.58 |
| Dimethylformamide | | | | | | | | | 0.3 J | 0.11 U |
| | | | | | | | | | | 0.12 U |

mg/Kg = milligram per kilogram

mV = millivolts

U = not detected,

value is the reporting limit

J = value is estimated

JEB = value is estimated, analyte detected in
an equipment blank

B = compound was found in the blank and
sample

* = LCS or LCSD exceeds the control limits

^ = ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA,
DLCK or MRL standard: Instrument related

QC exceeds the control limits.

HF = holding time exceeded

Prepared by / Date: KJC 03/04/14

Checked by / Date: CTM 03/10/14

Table 4.1-8
Summary of Detected Chemicals for Sediment Samples - On-Property West Ditch and West Ditch Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | | Average of All Samples | 1120-BD-C17 BD-C17 10/27/2000 0.2-0.2 ft | 1120-BD-C27 BD-C27 10/27/2000 0.5-0.5 ft | 1120-BD-C32 BD-C32 10/27/2000 0.6-0.6 ft | 1120-WDW-10D (6-30) WDW-10 8/31/2000 0.9-2.9 ft |
|--------------------------------------|------------------------|---|------|----------------------------------|-------|------------------------|---|---|---|--|
| Volatile Organics (mg/Kg) | | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | 2 / 10 | 0.018 | : | 0.98 | 1.3 | - | 5.4 | 0.91 | 0.98 U | 0.88 U |
| 2,4,4-Trimethyl-2-pentene | 2 / 10 | 0.018 | : | 0.98 | 0.59 | - | 2.3 | 0.53 | 0.98 U | 0.88 U |
| Acetone | 2 / 22 | 2.9 | : | 38 | 0.095 | - | 0.34 | 8.5 | 20 U | 18 U |
| Benzene | 1 / 22 | 0.018 | : | 1.9 | 4.4 | - | 4.4 | 0.62 | 0.98 U | 0.88 U |
| Chlorobenzene | 1 / 22 | 0.018 | : | 1.9 | 0.11 | - | 0.11 | 0.43 | 0.98 U | 0.88 U |
| Ethyl benzene | 1 / 22 | 0.018 | : | 1.9 | 0.54 | - | 0.54 | 0.45 | 0.98 U | 0.88 U |
| Methylene chloride | 3 / 22 | 0.018 | : | 1.9 | 0.66 | - | 1.1 | 0.54 | 0.98 U | 1.8 U |
| Xylenes (m&p) | 1 / 20 | 0.14 | : | 1.9 | 0.58 | - | 0.58 | 0.49 | 0.98 UK | 0.88 U |
| Semivolatile Organics (mg/Kg) | | | | | | | | | | |
| Benzo(b)fluoranthene | 1 / 70 | 0.36 | : | 440 | 3 | - | 3 | 6.6 | 21 U | 12 U |
| Bis(2-Ethylhexyl)phthalate | 37 / 70 | 1.1 | : | 54 | 1.1 | - | 871 | 27 | 244 | 8.9 J |
| Di-n-butylphthalate | 4 / 70 | 0.36 | : | 54 | 0.45 | - | 263 | 7.3 | 21 U | 12 U |
| Fluoranthene | 1 / 70 | 0.36 | : | 440 | 6.1 | - | 6.1 | 6.7 | 21 U | 12 U |
| N-Nitrosodiphenylamine | 1 / 70 | 0.36 | : | 440 | 2.6 | - | 2.6 | 6.6 | 21 U | 12 U |
| Phenanthrene | 1 / 70 | 0.36 | : | 440 | 3.2 | - | 3.2 | 6.6 | 21 U | 12 U |
| Pyrene | 1 / 70 | 0.36 | : | 440 | 4.2 | - | 4.2 | 6.6 | 21 U | 12 U |
| Inorganics (mg/Kg) | | | | | | | | | | |
| Aluminum | 37 / 37 | | | | 1100 | - | 14000 | 5460 | 1400 F | 1200 |
| Arsenic | 3 / 24 | | 2 | : | 9 | 3.9 | - | 7.77 | 3.2 | 7 U |
| Barium | 4 / 4 | | | | | 3.4 | - | 41.1 | 24 | |
| Beryllium | 1 / 4 | | 0.1 | : | 0.164 | 0.61 | - | 0.61 | 0.20 | |
| Cadmium | 5 / 26 | | 0.2 | : | 2 | 0.229 | - | 1.2 | 0.53 | 1 U |
| Calcium | 2 / 2 | | | | | 200 | - | 900 | 550 | |
| Chromium | 68 / 87 | | 6 | : | 19 | 4.5 | - | 430 | 40 | 36 |
| Copper | 2 / 2 | | | | | 2.1 | - | 17 | 9.6 | |
| Iron | 37 / 37 | | | | | 270 | - | 17000 | 6006 | 840 F |
| Lead | 19 / 26 | | 4 | : | 9 | 2.5 | - | 110 | 24 | 7 U |
| Magnesium | 2 / 2 | | | | | 88 | - | 180 | 134 | |
| Manganese | 2 / 2 | | | | | 4 | - | 22 | 13.0 | |
| Mercury | 5 / 24 | | 0.06 | : | 0.3 | 0.23 | - | 0.44 | 0.14 | 0.3 U |
| Nickel | 3 / 4 | | 2 | : | 2 | 6.7 | - | 11.4 | 7.1 | |
| Sodium | 1 / 2 | | 99 | : | 99 | 3200 | - | 3200 | 1625 | |
| Vanadium | 4 / 4 | | | | | 3 | - | 27 | 16.9 | |
| Zinc | 4 / 4 | | | | | 5.2 | - | 47.4 | 28 | |
| Total Organic Carbon | 2 / 2 | | | | | 1.6 | - | 2 | 1.8 | |

Table 4.1-8
Summary of Detected Chemicals for Sediment Samples - On-Property West Ditch and West Ditch Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | 1120-WDW-10S (0-6) WDW-10 8/31/2000 0.4-0.9 ft | 1120-WDW-12D (6-30) WDW-12 8/30/2000 0.5-2.5 ft | 1120-WDW-12S (0-6) WDW-12 8/30/2000 0-0.5 ft | 1120-WDW-13D (6-30) WDW-13 8/30/2000 0.5-2.5 ft | 1120-WDW-13S (0-6) WDW-13 8/30/2000 0-0.5 ft | 1120-WDW-14D (6-30) WDW-14 8/31/2000 0.5-2.5 ft | 1120-WDW-14S (0-6) WDW-14 8/31/2000 0-0.5 ft | 1120-WDW-16D (6-30) WDW-16 8/31/2000 0.5-2.5 ft | 1120-WDW-16S (0-6) WDW-16 8/31/2000 0-0.5 ft |
|--------------------------------------|---|--|---|--|---|--|---|--|---|
| Volatile Organics (mg/Kg) | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | | |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | | |
| Acetone | | | | | | 38 U | 15 U | 36 U | 16 U |
| Benzene | | | | | | 1.9 U | 0.73 U | 1.8 U | 0.8 U |
| Chlorobenzene | | | | | | 1.9 U | 0.73 U | 1.8 U | 0.8 U |
| Ethyl benzene | | | | | | 1.9 U | 0.73 U | 1.8 U | 0.8 U |
| Methylene chloride | | | | | | 1.9 U | 0.73 U | 1.8 U | 0.8 U |
| Xylenes (m&p) | | | | | | 1.9 U | 0.73 U | 1.8 U | 0.8 U |
| Semivolatile Organics (mg/Kg) | | | | | | | | | |
| Benzo(b)fluoranthene | 6.3 U | 4.5 U | 2 U | 4.8 U | 11 U | 4.2 U | 5.3 U | 5.8 U | 5.2 U |
| Bis(2-Ethylhexyl)phthalate | 6.3 U | 4.5 U | 2 U | 4.8 U | 11 J | 4.2 U | 5.3 U | 5.8 U | 5.2 U |
| Di-n-butylphthalate | 6.3 U | 4.5 U | 2 U | 4.8 U | 11 U | 4.2 U | 5.3 U | 5.8 U | 5.2 U |
| Fluoranthene | 6.3 U | 4.5 U | 2 U | 4.8 U | 11 U | 4.2 U | 5.3 U | 5.8 U | 5.2 U |
| N-Nitrosodiphenylamine | 6.3 U | 4.5 U | 2 U | 4.8 U | 11 U | 4.2 U | 5.3 U | 5.8 U | 5.2 U |
| Phenanthrene | 6.3 U | 4.5 U | 2 U | 4.8 U | 11 U | 4.2 U | 5.3 U | 5.8 U | 5.2 U |
| Pyrene | 6.3 U | 4.5 U | 2 U | 4.8 U | 11 U | 4.2 U | 5.3 U | 5.8 U | 5.2 U |
| Inorganics (mg/Kg) | | | | | | | | | |
| Aluminum | 3700 | | | | | 1600 | 4100 | 1600 | 3700 |
| Arsenic | 7 U | | | | | 8 U | 4 U | 8 U | 4 U |
| Barium | | | | | | | | | |
| Beryllium | | | | | | | | | |
| Cadmium | 1 U | | | | | 2 U | 0.9 U | 2 U | 0.87 |
| Calcium | | | | | | | | | |
| Chromium | 7 U | 9 U | 11 | 10 U | 19 | 8 U | 11 | 8 U | 29 |
| Copper | | | | | | | | | |
| Iron | 3600 | | | | | 1700 | 6600 | 1400 | 8000 |
| Lead | 22 | | | | | 8.2 | 82 | 8.7 | 110 |
| Magnesium | | | | | | | | | |
| Manganese | | | | | | | | | |
| Mercury | 0.2 U | | | | | 0.3 U | 0.28 | 0.2 U | 0.37 |
| Nickel | | | | | | | | | |
| Sodium | | | | | | | | | |
| Vanadium | | | | | | | | | |
| Zinc | | | | | | | | | |
| Total Organic Carbon | | | | | | | | | |

Table 4.1-8
Summary of Detected Chemicals for Sediment Samples - On-Property West Ditch and West Ditch Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | 1120-WDW-17D (6-30) WDW-17 8/30/2000 0.5-2.5 ft | 1120-WDW-17S (0-6) WDW-17 8/30/2000 0-0.5 ft | 1120-WDW-19D (6-30) WDW-19 8/30/2000 0.5-2.5 ft | 1120-WDW-19S (0-6) WDW-19 8/30/2000 0-0.5 ft | 1120-WDW-20D (6-30) WDW-20 8/31/2000 0.5-2.5 ft | 1120-WDW-20S (0-6) WDW-20 8/31/2000 0-0.5 ft | 1120-WDW-21AD (6-30) WDW-21A 8/30/2000 0.5-2.5 ft | 1120-WDW-21AS (0-6) WDW-21A 8/30/2000 0-0.5 ft | 1120-WDW-21BD (6-30) WDW-21B 8/30/2000 0.5-2.5 ft |
|--------------------------------------|--|---|--|---|--|---|--|---|--|
| Volatile Organics (mg/Kg) | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | | |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | | |
| Acetone | | | | | 29 U | 31 U | | | |
| Benzene | | | | | 1.4 U | 1.5 U | | | |
| Chlorobenzene | | | | | 1.4 U | 1.5 U | | | |
| Ethyl benzene | | | | | 1.4 U | 1.5 U | | | |
| Methylene chloride | | | | | 1.4 U | 1.5 U | | | |
| Xylenes (m&p) | | | | | 1.4 U | 1.5 U | | | |
| Semivolatile Organics (mg/Kg) | | | | | | | | | |
| Benzo(b)fluoranthene | 8.9 U | 4.9 U | 3.7 U | 12 U | 3.4 U | 4.2 U | 3.6 U | 2.2 U | 1.9 U |
| Bis(2-Ethylhexyl)phthalate | 8.9 U | 4.9 U | 3.7 U | 12 UB | 3.4 U | 4.2 UB | 4 | 2.2 U | 1.9 U |
| Di-n-butylphthalate | 8.9 U | 4.9 U | 3.7 U | 12 U | 3.4 U | 4.2 U | 3.6 U | 2.2 U | 1.9 U |
| Fluoranthene | 8.9 U | 4.9 U | 3.7 U | 12 U | 3.4 U | 4.2 U | 3.6 U | 2.2 U | 1.9 U |
| N-Nitrosodiphenylamine | 8.9 U | 4.9 U | 3.7 U | 12 U | 3.4 U | 4.2 U | 3.6 U | 2.2 U | 1.9 U |
| Phenanthrene | 8.9 U | 4.9 U | 3.7 U | 12 U | 3.4 U | 4.2 U | 3.6 U | 2.2 U | 1.9 U |
| Pyrene | 8.9 U | 4.9 U | 3.7 U | 12 U | 3.4 U | 4.2 U | 3.6 U | 2.2 U | 1.9 U |
| Inorganics (mg/Kg) | | | | | | | | | |
| Aluminum | | | | | 3200 | 3100 | | | |
| Arsenic | | | | | 7 U | 9 U | | | |
| Barium | | | | | | | | | |
| Beryllium | | | | | | | | | |
| Cadmium | | | | | 1 U | 2 U | | | |
| Calcium | | | | | | | | | |
| Chromium | 7 U | 17 | 22 | 69 | 8.8 | 9 U | 8.9 | 22 | 7 U |
| Copper | | | | | | | | | |
| Iron | | | | | 4600 | 1300 F | | | |
| Lead | | | | | 15 | 9 U | | | |
| Magnesium | | | | | | | | | |
| Manganese | | | | | | | | | |
| Mercury | | | | | 0.2 U | 0.3 U | | | |
| Nickel | | | | | | | | | |
| Sodium | | | | | | | | | |
| Vanadium | | | | | | | | | |
| Zinc | | | | | | | | | |
| Total Organic Carbon | | | | | | | | | |

Table 4.1-8
Summary of Detected Chemicals for Sediment Samples - On-Property West Ditch and West Ditch Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | 1120-WDW-21BS (0-6) WDW-21B 8/30/2000 0-0.5 ft | 1120-WDW-22D (6-30) WDW-22 8/30/2000 0.5-2.5 ft | 1120-WDW-22S (0-6) WDW-22 8/30/2000 0-0.5 ft | 1120-WDW-23D (6-30) WDW-23 8/31/2000 0.5-2.5 ft | 1120-WDW-23S (0-6) WDW-23 8/31/2000 0-0.5 ft | 1120-WDW-24D (6-24) WDW-24 8/30/2000 0.5-2 ft | 1120-WDW-24S (0-6) WDW-24 8/30/2000 0-0.5 ft | 1120-WDW-25D (6-30) WDW-25 8/30/2000 0.5-2.5 ft | 1120-WDW-25S (0-6) WDW-25 8/30/2000 0-0.5 ft |
|--------------------------------------|---|--|---|--|---|--|---|--|---|
| Volatile Organics (mg/Kg) | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | | |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | | |
| Acetone | | | | 20 U | 17 U | | | | |
| Benzene | | | | 1 U | 0.84 U | | | | |
| Chlorobenzene | | | | 1 U | 0.84 U | | | | |
| Ethyl benzene | | | | 1 U | 0.84 U | | | | |
| Methylene chloride | | | | 1 U | 0.84 U | | | | |
| Xylenes (m&p) | | | | 1 U | 0.84 U | | | | |
| Semivolatile Organics (mg/Kg) | | | | | | | | | |
| Benzo(b)fluoranthene | 4.6 UC | 3.9 U | 2.9 U | 4.9 U | 3.4 U | 6.8 U | 3.7 U | 2.3 U | 2.2 U |
| Bis(2-Ethylhexyl)phthalate | 4.6 UC | 3.9 U | 3.8 | 4.9 U | 6.6 | 8 | 8.2 | 13 | 2.2 U |
| Di-n-butylphthalate | 4.6 UC | 3.9 U | 2.9 U | 4.9 U | 3.4 U | 6.8 U | 3.7 U | 2.3 U | 2.2 U |
| Fluoranthene | 4.6 UC | 3.9 U | 2.9 U | 4.9 U | 3.4 U | 6.8 U | 3.7 U | 2.3 U | 2.2 U |
| N-Nitrosodiphenylamine | 4.6 UC | 3.9 U | 2.9 U | 4.9 U | 3.4 U | 6.8 U | 3.7 U | 2.3 U | 2.2 U |
| Phenanthrene | 4.6 UC | 3.9 U | 2.9 U | 4.9 U | 3.4 U | 6.8 U | 3.7 U | 2.3 U | 2.2 U |
| Pyrene | 4.6 UC | 3.9 U | 2.9 U | 4.9 U | 3.4 U | 6.8 U | 3.7 U | 2.3 U | 2.2 U |
| Inorganics (mg/Kg) | | | | | | | | | |
| Aluminum | | | | 2000 | 2800 | | | | |
| Arsenic | | | | 4 U | 5 U | | | | |
| Barium | | | | | | | | | |
| Beryllium | | | | | | | | | |
| Cadmium | | | | 0.8 U | 1 U | | | | |
| Calcium | | | | | | | | | |
| Chromium | 42 | 6.4 | 21 | 4.8 | 22 | 12 U | 48 | 11 U | 19 |
| Copper | | | | | | | | | |
| Iron | | | | 1300 | 5100 | | | | |
| Lead | | | | 4 U | 44 | | | | |
| Magnesium | | | | | | | | | |
| Manganese | | | | | | | | | |
| Mercury | | | | 0.2 U | 0.23 | | | | |
| Nickel | | | | | | | | | |
| Sodium | | | | | | | | | |
| Vanadium | | | | | | | | | |
| Zinc | | | | | | | | | |
| Total Organic Carbon | | | | | | | | | |

Table 4.1-8
Summary of Detected Chemicals for Sediment Samples - On-Property West Ditch and West Ditch Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | 1120-WDW-26D (6-24) WDW-26 8/30/2000 0.5-2 ft | 1120-WDW-26S (0-6) WDW-26 8/30/2000 0-0.5 ft | 1120-WDW-27D (6-30) WDW-27 8/31/2000 0.5-2.5 ft | 1120-WDW-27S (0-6) WDW-27 8/31/2000 0-0.5 ft | 1120-WDW-28D (6-24) WDW-28 8/30/2000 0.5-2 ft | 1120-WDW-28S (0-6) WDW-28 8/30/2000 0-0.5 ft | 1120-WDW-29D (6-30) WDW-29 8/30/2000 0.5-2.5 ft | 1120-WDW-29S (0-6) WDW-29 8/30/2000 0-0.5 ft | 1120-WDW-30D WDW-30 8/30/2000 0.5-2.5 ft |
|--------------------------------------|--|---|--|---|--|---|--|---|---|
| Volatile Organics (mg/Kg) | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | | |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | | |
| Acetone | | | | 23 U | 25 U | | | | |
| Benzene | | | | 1.2 U | 1.3 U | | | | |
| Chlorobenzene | | | | 1.2 U | 1.3 U | | | | |
| Ethyl benzene | | | | 1.2 U | 1.3 U | | | | |
| Methylene chloride | | | | 1.2 U | 1.3 U | | | | |
| Xylenes (m&p) | | | | 1.2 U | 1.3 U | | | | |
| Semivolatile Organics (mg/Kg) | | | | | | | | | |
| Benzo(b)fluoranthene | 2.7 U | 2.1 U | 7.7 U | 3 JC | 1.2 U | 2.2 U | 7.4 U | 4.6 U | 1.8 U |
| Bis(2-Ethylhexyl)phthalate | 4.8 | 9.3 | 7.7 U | 5.6 UC | 1.2 U | 2.9 | 11 | 4.9 | 1.8 U |
| Di-n-butylphthalate | 2.7 U | 2.1 U | 7.7 U | 5.6 UC | 1.2 U | 2.2 U | 7.4 U | 4.6 U | 1.8 U |
| Fluoranthene | 2.7 U | 2.1 U | 7.7 U | 6.1 C | 1.2 U | 2.2 U | 7.4 U | 4.6 U | 1.8 U |
| N-Nitrosodiphenylamine | 2.7 U | 2.1 U | 7.7 U | 5.6 UC | 1.2 U | 2.2 U | 7.4 U | 4.6 U | 1.8 U |
| Phenanthrene | 2.7 U | 2.1 U | 7.7 U | 3.2 JC | 1.2 U | 2.2 U | 7.4 U | 4.6 U | 1.8 U |
| Pyrene | 2.7 U | 2.1 U | 7.7 U | 4.2 JC | 1.2 U | 2.2 U | 7.4 U | 4.6 U | 1.8 U |
| Inorganics (mg/Kg) | | | | | | | | | |
| Aluminum | | | | 3300 | 3800 | | | | |
| Arsenic | | | | 6 U | 5 U | | | | |
| Barium | | | | | | | | | |
| Beryllium | | | | | | | | | |
| Cadmium | | | | 1 U | 1.2 | | | | |
| Calcium | | | | | | | | | |
| Chromium | 14 U | 10 U | 7.1 | 42 | 6 U | 15 | 19 U | 28 | 6 U |
| Copper | | | | | | | | | |
| Iron | | | | 1700 | 5000 | | | | |
| Lead | | | | 6 U | 66 | | | | |
| Magnesium | | | | | | | | | |
| Manganese | | | | | | | | | |
| Mercury | | | | 0.08 U | 0.44 | | | | |
| Nickel | | | | | | | | | |
| Sodium | | | | | | | | | |
| Vanadium | | | | | | | | | |
| Zinc | | | | | | | | | |
| Total Organic Carbon | | | | | | | | | |

Table 4.1-8
Summary of Detected Chemicals for Sediment Samples - On-Property West Ditch and West Ditch Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | 1120-WDW-30S WDW-30 8/30/2000 0-0.5 ft | 1120-WDW-31D WDW-31 8/30/2000 0.5-2.5 ft | 1120-WDW-31S WDW-31 8/30/2000 0-0.5 ft | 1120-WDW-32D (6-30) WDW-32 8/31/2000 0.5-2.5 ft | 1120-WDW-32S (0-6) WDW-32 8/31/2000 0-0.5 ft | 1140-WDW-11D WDW-11 8/25/2000 0.5-2.1 ft | 1140-WDW-11S WDW-11 8/25/2000 0-0.5 ft | 1140-WDW-C1 WDW-C1 10/18/2000 0.5-0.5 ft | 1140-WDW-C11 WDW-C11 10/18/2000 2.2-2.2 ft |
|--------------------------------------|---|---|---|--|---|---|---|---|---|
| Volatile Organics (mg/Kg) | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | | 0.66 U |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | | 0.66 U |
| Acetone | | | | | 7.1 U | 17 U | | | 13 U |
| Benzene | | | | | 0.36 U | 0.87 U | | | 0.66 U |
| Chlorobenzene | | | | | 0.36 U | 0.87 U | | | 0.66 U |
| Ethyl benzene | | | | | 0.36 U | 0.87 U | | | 0.66 U |
| Methylene chloride | | | | | 0.36 U | 0.87 U | | | 0.66 JB |
| Xylenes (m&p) | | | | | 0.36 U | 0.87 U | | | 0.66 U |
| Semivolatile Organics (mg/Kg) | | | | | | | | | |
| Benzo(b)fluoranthene | 4.1 U | 2.6 U | 3.7 U | 1.1 U | 4.8 U | 8.1 U | 3.1 U | 8.2 U | 1.8 U |
| Bis(2-Ethylhexyl)phthalate | 4.1 U | 4.7 | 3.7 U | 1.1 U | 4.8 UB | 8.1 UB | 3.1 UB | 8.2 U | 1.5 J |
| Di-n-butylphthalate | 4.1 U | 2.6 U | 3.7 U | 1.1 U | 4.8 U | 8.1 U | 3.1 U | 8.2 U | 1.8 U |
| Fluoranthene | 4.1 U | 2.6 U | 3.7 U | 1.1 U | 4.8 U | 8.1 U | 3.1 U | 8.2 U | 1.8 U |
| N-Nitrosodiphenylamine | 4.1 U | 2.6 U | 3.7 U | 1.1 U | 4.8 U | 8.1 U | 3.1 U | 8.2 U | 1.8 U |
| Phenanthrene | 4.1 U | 2.6 U | 3.7 U | 1.1 U | 4.8 U | 8.1 U | 3.1 U | 8.2 U | 1.8 U |
| Pyrene | 4.1 U | 2.6 U | 3.7 U | 1.1 U | 4.8 U | 8.1 U | 3.1 U | 8.2 U | 1.8 U |
| Inorganics (mg/Kg) | | | | | | | | | |
| Aluminum | | | | | 5000 | 7300 | | | 1400 |
| Arsenic | | | | | 2 U | 4 U | | | 6 U |
| Barium | | | | | | | | | |
| Beryllium | | | | | | | | | |
| Cadmium | | | | | 0.4 U | 0.7 U | | | 1 U |
| Calcium | | | | | | | | | |
| Chromium | 10 | 40 | 29 | 6.3 | 19 | 8 U | 13 | 19 | 10 |
| Copper | | | | | | | | | |
| Iron | | | | | 910 | 2800 | | | 4200 |
| Lead | | | | | 12 | 100 | | | 6 U |
| Magnesium | | | | | | | | | |
| Manganese | | | | | | | | | |
| Mercury | | | | | 0.07 U | 0.25 | | | 0.2 U |
| Nickel | | | | | | | | | |
| Sodium | | | | | | | | | |
| Vanadium | | | | | | | | | |
| Zinc | | | | | | | | | |
| Total Organic Carbon | | | | | | | | | |

Table 4.1-8
Summary of Detected Chemicals for Sediment Samples - On-Property West Ditch and West Ditch Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | 1140-WDW-C12 WDW-C12 10/11/2000 2.1-2.1 ft | 1140-WDW-C13 WDW-C13 10/18/2000 0.5-0.5 ft | 1140-WDW-C14 WDW-C14 10/18/2000 0.5-0.5 ft | 1140-WDW-C15 WDW-C15 10/11/2000 1.5-1.5 ft | 1140-WDW-C16 WDW-C16 10/18/2000 0.5-0.5 ft | 1140-WDW-C17 WDW-C17 11/1/2000 0.5-0.5 ft | 1140-WDW-C18 WDW-C18 11/2/2000 2.7-2.7 ft | 1140-WDW-C19 WDW-C19 11/1/2000 0.5-0.5 ft | 1140-WDW-C2 WDW-C2 10/18/2000 0.5-0.5 ft |
|--------------------------------------|---|---|---|---|---|--|--|--|---|
| Volatile Organics (mg/Kg) | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | 5.4 | |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | 2.3 | |
| Acetone | | | | | | | | 3.6 U | |
| Benzene | | | | | | | | 0.18 U | |
| Chlorobenzene | | | | | | | | 0.18 U | |
| Ethyl benzene | | | | | | | | 0.54 | |
| Methylene chloride | | | | | | | | 0.18 U | |
| Xylenes (m&p) | | | | | | | | 0.58 | |
| Semivolatile Organics (mg/Kg) | | | | | | | | | |
| Benzo(b)fluoranthene | 3 U | 0.8 U | 3.3 U | 2.9 U | 2 U | 54 UC | 53 UC | 4.1 UC | 5.1 U |
| Bis(2-Ethylhexyl)phthalate | 2.6 J | 2.3 | 3.3 U | 14 | 6 | 54 UC | 116 C | 6.4 C | 13 |
| Di-n-butylphthalate | 3 U | 0.45 J | 3.3 U | 2.9 U | 2 U | 54 UC | 53 UC | 4.1 UC | 5.1 U |
| Fluoranthene | 3 U | 0.8 U | 3.3 U | 2.9 U | 2 U | 54 UC | 53 UC | 4.1 UC | 5.1 U |
| N-Nitrosodiphenylamine | 3 U | 0.8 U | 3.3 U | 2.9 U | 2 U | 54 UC | 53 UC | 2.6 JC | 5.1 U |
| Phenanthrene | 3 U | 0.8 U | 3.3 U | 2.9 U | 2 U | 54 UC | 53 UC | 4.1 UC | 5.1 U |
| Pyrene | 3 U | 0.8 U | 3.3 U | 2.9 U | 2 U | 54 UC | 53 UC | 4.1 UC | 5.1 U |
| Inorganics (mg/Kg) | | | | | | | | | |
| Aluminum | | | | | | | | 2300 | |
| Arsenic | | | | | | | | 2 U | |
| Barium | | | | | | | | | |
| Beryllium | | | | | | | | | |
| Cadmium | | | | | | | | 0.3 U | |
| Calcium | | | | | | | | | |
| Chromium | 19 | 260 | 12 | 11 U | 350 | 16 | 68 | 20 | 21 |
| Copper | | | | | | | | | |
| Iron | | | | | | | | 630 | |
| Lead | | | | | | | | 2.5 | |
| Magnesium | | | | | | | | | |
| Manganese | | | | | | | | | |
| Mercury | | | | | | | | 0.07 U | |
| Nickel | | | | | | | | | |
| Sodium | | | | | | | | | |
| Vanadium | | | | | | | | | |
| Zinc | | | | | | | | | |
| Total Organic Carbon | | | | | | | | | |

Table 4.1-8
Summary of Detected Chemicals for Sediment Samples - On-Property West Ditch and West Ditch Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | 1140-WDW-C20 WDW-C20 11/2/2000 3.1-3.1 ft | 1140-WDW-C23 WDW-C23 11/2/2000 3-3 ft | 1140-WDW-C24 WDW-C24 11/2/2000 1.5-1.5 ft | 1140-WDW-C3 WDW-C3 10/11/2000 2.5-2.5 ft | 1140-WDW-C4 WDW-C4 10/18/2000 0.4-0.4 ft | 1140-WDW-C5 WDW-C5 10/18/2000 0.7-0.7 ft | 1140-WDW-C6 WDW-C6 10/11/2000 2.5-2.5 ft | 1140-WDW-C7 WDW-C7 10/18/2000 2.7-2.7 ft | 1140-WDW-C8 WDW-C8 10/18/2000 0.2-0.2 ft |
|--------------------------------------|--|--|--|---|---|---|---|---|---|
| Volatile Organics (mg/Kg) | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | 1.3 | | | | | 0.65 U | 0.72 U | | |
| 2,4,4-Trimethyl-2-pentene | 0.59 | | | | | 0.65 U | 0.72 U | | |
| Acetone | 2.9 U | | | | | 13 U | 14 U | | |
| Benzene | 0.14 U | | | | | 0.65 U | 0.72 U | | |
| Chlorobenzene | 0.14 U | | | | | 0.65 U | 0.72 U | | |
| Ethyl benzene | 0.14 U | | | | | 0.65 U | 0.72 U | | |
| Methylene chloride | 0.14 U | | | | | 0.87 B | 1.1 B | | |
| Xylenes (m&p) | 0.14 U | | | | | 0.65 U | 0.72 U | | |
| Semivolatile Organics (mg/Kg) | | | | | | | | | |
| Benzo(b)fluoranthene | 41 UC | 440 UC | 46 UC | 0.99 U | 1.5 U | 5.5 U | 0.46 U | 4.6 U | 6.2 U |
| Bis(2-Ethylhexyl)phthalate | 147 C | 871 C | 208 C | 1.1 | 1.8 | 3.2 J | 2.8 | 6.7 | 3.5 J |
| Di-n-butylphthalate | 41 UC | 263 JC | 26 JC | 0.99 U | 1.5 U | 5.5 U | 0.46 U | 4.6 U | 4.1 J |
| Fluoranthene | 41 UC | 440 UC | 46 UC | 0.99 U | 1.5 U | 5.5 U | 0.46 U | 4.6 U | 6.2 U |
| N-Nitrosodiphenylamine | 41 UC | 440 UC | 46 UC | 0.99 U | 1.5 U | 5.5 U | 0.46 U | 4.6 U | 6.2 U |
| Phenanthrene | 41 UC | 440 UC | 46 UC | 0.99 U | 1.5 U | 5.5 U | 0.46 U | 4.6 U | 6.2 U |
| Pyrene | 41 UC | 440 UC | 46 UC | 0.99 U | 1.5 U | 5.5 U | 0.46 U | 4.6 U | 6.2 U |
| Inorganics (mg/Kg) | | | | | | | | | |
| Aluminum | 6600 | | | | | 3000 | 3000 | | |
| Arsenic | 3.9 | | | | | 6 U | 5 U | | |
| Barium | | | | | | | | | |
| Beryllium | | | | | | | | | |
| Cadmium | 0.3 U | | | | | 1 U | 1 U | | |
| Calcium | | | | | | | | | |
| Chromium | 41 | 410 | 110 | 170 | 24 | 37 | 31 | 64 | 31 |
| Copper | | | | | | | | | |
| Iron | 6900 | | | | | 3700 | 7800 | | |
| Lead | 4 | | | | | 13 | 31 | | |
| Magnesium | | | | | | | | | |
| Manganese | | | | | | | | | |
| Mercury | 0.06 U | | | | | 0.2 U | 0.2 U | | |
| Nickel | | | | | | | | | |
| Sodium | | | | | | | | | |
| Vanadium | | | | | | | | | |
| Zinc | | | | | | | | | |
| Total Organic Carbon | | | | | | | | | |

Table 4.1-8
Summary of Detected Chemicals for Sediment Samples - On-Property West Ditch and West Ditch Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | 1140-WDW-C9 WDW-C9 10/11/2000 3.5-3.5 ft | OC-SD-SD1 SD-SD1 11/16/2007 0-0.25 ft | OC-SD-SD1 SD-SD1 11/19/2008 0-0.3 ft | OC-SD-SD1- SD1-0.0/0.5 SD-SD1 11/11/2009 0-0.5 ft | OC-SD-SD1- 0.0/0.5 SD-SD1 11/15/2010 0-0.5 ft | OC-SD-SD1- 0.0/0.5 SD-SD1 11/11/2011 0-0.5 ft | OC-SD-SD1 SD-SD1 11/16/2012 0-0.5 ft | OC-SD-SD1 SD-SD1 11/21/2013 0-0.5 ft | RSD-01 RSD-01 1/18/2000 |
|--------------------------------------|---|--|---|---|---|---|---|---|-------------------------------|
| Volatile Organics (mg/Kg) | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | | | | | | | | | 0.018 U |
| 2,4,4-Trimethyl-2-pentene | | | | | | | | | 0.018 U |
| Acetone | | | | | | | | | 0.095 |
| Benzene | | | | | | | | | 0.018 U |
| Chlorobenzene | | | | | | | | | 0.018 UU |
| Ethyl benzene | | | | | | | | | 0.018 U |
| Methylene chloride | | | | | | | | | 0.018 U |
| Xylenes (m&p) | | | | | | | | | |
| Semivolatile Organics (mg/Kg) | | | | | | | | | |
| Benzo(b)fluoranthene | 2.5 U | | | | | | | | 2.3 U |
| Bis(2-Ethylhexyl)phthalate | 2.4 J | | | | | | | | 14 |
| Di-n-butylphthalate | 2.5 U | | | | | | | | 2.3 U |
| Fluoranthene | 2.5 U | | | | | | | | 2.3 U |
| N-Nitrosodiphenylamine | 2.5 U | | | | | | | | 2.3 U |
| Phenanthrene | 2.5 U | | | | | | | | 2.3 U |
| Pyrene | 2.5 U | | | | | | | | 2.3 U |
| Inorganics (mg/Kg) | | | | | | | | | |
| Aluminum | | 8500 | 11000 | 9200 | 9300 | 11000 J | 7100 J | 9800 J | 3600 |
| Arsenic | | | | | | | | | 3.4 |
| Barium | | | | | | | | | 0.1 U |
| Beryllium | | | | | | | | | 0.2 U |
| Cadmium | | | | | | | | | 200 |
| Calcium | | | | | | | | | 4.5 |
| Chromium | 180 | 20 | 29 J | 21 | 21 | 30 | 67 | 24 | 2.1 |
| Copper | | | | | | | | | 270 |
| Iron | | 10000 | 14000 | 11000 | 11000 | 13000 J | 9000 | 12000 | 4.6 |
| Lead | | | | | | | | | 88 |
| Magnesium | | | | | | | | | 4 |
| Manganese | | | | | | | | | 0.06 U |
| Mercury | | | | | | | | | 2 U |
| Nickel | | | | | | | | | 99 U |
| Sodium | | | | | | | | | 3 |
| Vanadium | | | | | | | | | 5.2 |
| Zinc | | | | | | | | | |
| Total Organic Carbon | | | | | | | | | |

Table 4.1-8
Summary of Detected Chemicals for Sediment Samples - On-Property West Ditch and West Ditch Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | RSD-02 RSD-02 1/18/2000 | RSD-16 RSD-16 5/23/2000 | RSD-17 RSD-17 5/23/2000 | RSD-18 RSD-18 5/23/2000 | RSD-19 RSD-19 5/23/2000 | SD-SD1-(15)- 03 SD-SD1 5/19/2005 | SD-SD1-03-01 SD-SD1 6/17/2003 | SD-SD1-03-02 SD-SD1 8/10/2004 | SD-SD1-03-03 SD-SD1 5/19/2005 |
|--------------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---|-------------------------------------|-------------------------------------|-------------------------------------|
| Volatile Organics (mg/Kg) | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | 0.043 U | | | | | | | | |
| 2,4,4-Trimethyl-2-pentene | 0.043 U | | | | | | | | |
| Acetone | 0.34 | | | | | | | | |
| Benzene | 4.4 J | | | | | | | | |
| Chlorobenzene | 0.11 J | | | | | | | | |
| Ethyl benzene | 0.043 U | | | | | | | | |
| Methylene chloride | 0.043 U | | | | | | | | |
| Xylenes (m&p) | | | | | | | | | |
| Semivolatile Organics (mg/Kg) | | | | | | | | | |
| Benzo(b)fluoranthene | 1.6 U | | | | | | | | |
| Bis(2-Ethylhexyl)phthalate | 4 | | | | | | | | |
| Di-n-butylphthalate | 1.6 U | | | | | | | | |
| Fluoranthene | 1.6 U | | | | | | | | |
| N-Nitrosodiphenylamine | 1.6 U | | | | | | | | |
| Phenanthrene | 1.6 U | | | | | | | | |
| Pyrene | 1.6 U | | | | | | | | |
| Inorganics (mg/Kg) | | | | | | | | | |
| Aluminum | 14000 | | | | | 7700 | 9750 | 6200 | 11000 |
| Arsenic | | | | | | | 7.77 | | |
| Barium | 13 | | | | | | 37.6 | | |
| Beryllium | 0.61 | | | | | | 0.164 U | | |
| Cadmium | 0.47 | | | | | | 0.229 | | |
| Calcium | 900 | | | | | | | | |
| Chromium | 13 | 430 J | 12 | 33 | 16 | 17 | 17.9 | 19 | 39 |
| Copper | 17 | | | | | | | | |
| Iron | 2100 | | | | | | 9600 | 12200 | 12000 |
| Lead | 7.3 | | | | | | | 28.8 | |
| Magnesium | 180 | | | | | | | | |
| Manganese | 22 | | | | | | | | |
| Mercury | 0.2 U | | | | | | | | |
| Nickel | 6.7 | | | | | | 9.31 | | |
| Sodium | 3200 | | | | | | | | |
| Vanadium | 27 | | | | | | 17 | | |
| Zinc | 14 | | | | | | 47.4 | | |
| Total Organic Carbon | | | | | | | | 1.6 | |

Table 4.1-8
Summary of Detected Chemicals for Sediment Samples - On-Property West Ditch and West Ditch Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param.name | SD-SD1-15-01 SD-SD1 6/17/2003 0.25-1.25 ft | SD-SD1-15-02 SD-SD1 8/10/2004 0.25-1.25 ft |
|--------------------------------------|---|---|
| Volatile Organics (mg/Kg) | | |
| 2,4,4-Trimethyl-1-pentene | | |
| 2,4,4-Trimethyl-2-pentene | | |
| Acetone | | |
| Benzene | | |
| Chlorobenzene | | |
| Ethyl benzene | | |
| Methylene chloride | | |
| Xylenes (m&p) | | |
| Semivolatile Organics (mg/Kg) | | |
| Benzo(b)fluoranthene | | |
| Bis(2-Ethylhexyl)phthalate | | |
| Di-n-butylphthalate | | |
| Fluoranthene | | |
| N-Nitrosodiphenylamine | | |
| Phenanthrene | | |
| Pyrene | | |
| Inorganics (mg/Kg) | | |
| Aluminum | 7360 | 7100 |
| Arsenic | 6.82 | |
| Barium | 41.1 | |
| Beryllium | 0.146 U | |
| Cadmium | 0.261 | |
| Calcium | | |
| Chromium | 23.9 | 15 |
| Copper | | |
| Iron | 8840 | 10000 |
| Lead | 25.8 | |
| Magnesium | | |
| Manganese | | |
| Mercury | | |
| Nickel | 11.4 | |
| Sodium | | |
| Vanadium | 20.5 | |
| Zinc | 46.8 | |
| Total Organic Carbon | | 2 |

mg/Kg = milligram per kilogram

U = not detected, value is the reporting limit

J = value is estimated

B = analyte was detected in the sample and its associated blank

C = value is estimated, surrogate recovery outside of control limits

F = value is estimated, matrix spike recovery outside of control limits

K = value is estimated, blank spike compound recovery outside the control limits

Prepared by / Date: KJC 03/04/14

Checked by / Date: CTM 03/10/14

Table 4.1-9
Summary of Detected Chemicals for Sediment Samples - Central Pond
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | | Average of All Samples | OC-SD-SD4-0.0/0.5 SD-SD4 11/11/2011 0-0.5 ft | OC-SD-SD4 SD-SD4 11/16/2012 0-0.5 ft | OC-SD-SD4 SD-SD4 11/21/2013 0-0.5 ft | OC-SD-SD-501-XXX SD-501 12/17/2012 | OC-SD-SD-502-XXX SD-502 12/17/2012 |
|--------------------------------------|------------------------|---|---|----------------------------------|---------|------------------------|---|---|---|---------------------------------------|---------------------------------------|
| Volatile Organics (mg/Kg) | | | | | | | | | | | |
| 2,4,4-Trimethyl-1-pentene | 1 / 2 | 0.0051 | : | 0.0051 | 0.011 | - | 0.011 | 0.0068 | | | 0.0051 U |
| 2,4,4-Trimethyl-2-pentene | 1 / 2 | 0.0051 | : | 0.0051 | 0.0088 | - | 0.0088 | 0.0057 | | | 0.0051 U |
| 2-Butanone | 2 / 2 | | | | 0.025 | - | 0.027 | 0.026 | | | 0.027 J |
| Acetone | 2 / 2 | | | | 0.11 | - | 0.12 | 0.12 | | | 0.12 J |
| Methyl Tertbutyl Ether | 1 / 2 | 0.0029 | : | 0.0029 | 0.0017 | - | 0.0017 | 0.0016 | | | 0.0017 J |
| Toluene | 1 / 2 | 0.0029 | : | 0.0029 | 0.00098 | - | 0.00098 | 0.0012 | | | 0.00098 J |
| Semivolatile Organics (mg/Kg) | | | | | | | | | | | |
| 3 & 4 Methylphenol | 2 / 2 | | | | 4.3 | - | 6.1 | 5.2 | | | 4.3 |
| Acetophenone | 2 / 2 | | | | 0.15 | - | 0.26 | 0.21 | | | 0.15 J |
| Benzaldehyde | 2 / 2 | | | | 1.4 | - | 1.9 | 1.7 | | | 1.4 |
| Benzo(b)fluoranthene | 1 / 2 | 0.46 | : | 0.46 | 0.14 | - | 0.14 | 0.19 | | | 0.46 U |
| Fluoranthene | 2 / 2 | | | | 0.21 | - | 0.29 | 0.25 | | | 0.21 J |
| Phenanthrene | 1 / 2 | 0.46 | : | 0.46 | 0.21 | - | 0.21 | 0.22 | | | 0.46 U |
| Phenol | 2 / 2 | | | | 1.7 | - | 2.2 | 2.0 | | | 1.7 |
| Pyrene | 2 / 2 | | | | 0.18 | - | 0.23 | 0.21 | | | 0.18 J |
| Inorganics (mg/Kg) | | | | | | | | | | | |
| Aluminum | 5 / 5 | | | | 6500 | - | 9900 | 7580 | 9900 J | 7700 J | 7300 |
| Arsenic | 2 / 2 | | | | 6.2 | - | 8.1 | 7.2 | | | 6.2 |
| Barium | 2 / 2 | | | | 45 | - | 46 | 46 | | | 45 |
| Beryllium | 2 / 2 | | | | 0.09 | - | 0.094 | 0.092 | | | 0.094 J |
| Cadmium | 2 / 2 | | | | 0.21 | - | 0.26 | 0.24 | | | 0.21 J |
| Calcium | 2 / 2 | | | | 3800 | - | 3900 | 3850 | | | 3900 |
| Chromium | 5 / 5 | | | | 15 | - | 140 | 45 | 140 | 24 | 15 |
| Chromium, Hexavalent | 2 / 2 | | | | 0.21 | - | 0.27 | 0.24 | | | 0.21 J |
| Cobalt | 2 / 2 | | | | 3.9 | - | 4 | 4.0 | | | 4 |
| Copper | 2 / 2 | | | | 21 | - | 21 | 21 | | | 21 |
| Iron | 5 / 5 | | | | 9200 | - | 17000 | 10980 | 17000 J | 9900 | 9300 |
| Lead | 2 / 2 | | | | 50 | - | 51 | 51 | | | 51 |
| Magnesium | 2 / 2 | | | | 1800 | - | 2000 | 1900 | | | 2000 |
| Manganese | 2 / 2 | | | | 440 | - | 590 | 515 | | | 590 |
| Mercury | 2 / 2 | | | | 0.057 | - | 0.07 | 0.064 | | | 0.07 J |
| Nickel | 2 / 2 | | | | 8.7 | - | 8.7 | 8.7 | | | 8.7 |
| Potassium | 2 / 2 | | | | 730 | - | 790 | 760 | | | 790 |
| Selenium | 1 / 2 | 0.72 | : | 0.72 | 0.7 | - | 0.7 | 0.53 | | | 0.7 J |
| Sodium | 2 / 2 | | | | 140 | - | 150 | 145 | | | 140 J |
| Tin | 2 / 2 | | | | 2.1 | - | 2.2 | 2.2 | | | 2.1 J |
| Vanadium | 2 / 2 | | | | 16 | - | 17 | 16.5 | | | 17 |
| Zinc | 2 / 2 | | | | 65 | - | 65 | 65 | | | 65 |
| Chloride | 2 / 2 | | | | 18 | - | 24 | 21 | | | 24 |
| Nitrogen, as Ammonia | 2 / 2 | | | | 17 | - | 35 | 26 | | | 17 |
| | | | | | | | | | | | 35 |

Table 4.1-9
Summary of Detected Chemicals for Sediment Samples - Central Pond
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| param_name | Frequency of Detection | Range of Reporting Limits for Non Detects | Range of Detected Concentrations | Average of All Samples | OC-SD-SD4-0.0/0.5 SD-SD4 11/11/2011 0-0.5 ft | OC-SD-SD4 SD-SD4 11/16/2012 0-0.5 ft | OC-SD-SD4 SD-SD4 11/21/2013 0-0.5 ft | OC-SD-SD-501-XXX SD-501 12/17/2012 12/17/2012 | OC-SD-SD-502-XXX SD-502 12/17/2012 12/17/2012 |
|------------------------------------|------------------------|---|----------------------------------|------------------------|---|---|---|--|--|
| Oxidation Reduction Potential (mV) | 2 / 2 | | -32 - -31 | -31.5 | | | | | -31 - -32 |
| pH (pH units) | 2 / 2 | | 7.23 - 7.32 | 7.3 | | | | | 7.32 - 7.23 |
| Sulfate | 2 / 2 | | 510 - 1200 | 855 | | | | | 510 - 1200 |
| Total Organic Carbon | 2 / 2 | | 80 - 90 | 85 | | | | | 90 - 80 |

mg/Kg = milligram per kilogram

mV = millivolts

U = not detected,

value is the reporting limit

J = value is estimated

Prepared by / Date: KJC 03/04/14

Checked by / Date: CTM 03/10/14

Table 4.1-10
Summary of Detected Chemicals for Sediment Samples - Detention Basin
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | Range of Detected Concentrations | Average of All Samples | OC-SD-SD-503-XXX SD-503 12/17/2012 | OC-SD-SD-504-XXX SD-504 12/17/2012 |
|--------------------------------------|------------------------|---|----------------------------------|------------------------|--|--|
| Volatile Organics (mg/Kg) | | | | | | |
| 2,4,4-Trimethyl-1-pentene | 2 / 2 | | 0.0024 - 0.0078 | 0.0051 | 0.0024 J | 0.0078 |
| 2,4,4-Trimethyl-2-pentene | 2 / 2 | | 0.0014 - 0.0039 | 0.0027 | 0.0014 J | 0.0039 J |
| 2-Butanone | 2 / 2 | | 0.033 - 0.035 | 0.034 | 0.035 | 0.033 J |
| Acetone | 2 / 2 | | 0.13 - 0.15 | 0.14 | 0.15 J | 0.13 J |
| Semivolatile Organics (mg/Kg) | | | | | | |
| 3 & 4 Methylphenol | 2 / 2 | | 1.8 - 4 | 2.9 | 4 | 1.8 |
| Acetophenone | 1 / 2 | 0.58 : 0.58 | 0.16 - 0.16 | 0.23 | 0.16 J | 0.58 U |
| Benzaldehyde | 2 / 2 | | 0.62 - 1.3 | 0.96 | 1.3 | 0.62 |
| Benzo(a)pyrene | 1 / 2 | 0.52 : 0.52 | 0.22 - 0.22 | 0.24 | 0.52 U | 0.22 J |
| Bis(2-Ethylhexyl)phthalate | 1 / 2 | 2.9 : 2.9 | 3.1 - 3.1 | 2.3 | 3.1 | 2.9 U |
| N-Nitrosodiphenylamine | 1 / 2 | 0.58 : 0.58 | 0.33 - 0.33 | 0.31 | 0.33 J | 0.58 U |
| Phenol | 2 / 2 | | 1.4 - 1.9 | 1.7 | 1.9 | 1.4 |
| Inorganics (mg/Kg) | | | | | | |
| Aluminum | 2 / 2 | | 7800 - 9100 | 8450 | 9100 J | 7800 J |
| Arsenic | 2 / 2 | | 9.4 - 12 | 10.7 | 12 | 9.4 |
| Barium | 2 / 2 | | 48 - 51 | 50 | 48 | 51 |
| Beryllium | 2 / 2 | | 0.089 - 0.12 | 0.10 | 0.12 J | 0.089 J |
| Cadmium | 2 / 2 | | 0.55 - 0.56 | 0.56 | 0.55 | 0.56 |
| Calcium | 2 / 2 | | 4700 - 4800 | 4750 | 4700 | 4800 |
| Chromium | 2 / 2 | | 33 - 50 | 42 | 50 | 33 |
| Cobalt | 2 / 2 | | 4.5 - 4.8 | 4.7 | 4.8 | 4.5 |
| Copper | 2 / 2 | | 19 - 25 | 22 | 19 | 25 |
| Iron | 2 / 2 | | 11000 - 12000 | 11500 | 12000 J | 11000 J |
| Lead | 2 / 2 | | 23 - 26 | 25 | 26 | 23 |
| Magnesium | 2 / 2 | | 2000 - 2300 | 2150 | 2300 | 2000 |
| Manganese | 2 / 2 | | 400 - 440 | 420 | 400 | 440 |
| Mercury | 2 / 2 | | 0.062 - 0.075 | 0.069 | 0.075 J | 0.062 J |
| Nickel | 2 / 2 | | 9.9 - 11 | 10.5 | 11 | 9.9 |
| Potassium | 2 / 2 | | 740 - 1100 | 920 | 1100 | 740 |
| Sodium | 2 / 2 | | 110 - 150 | 130 | 110 J | 150 J |
| Tin | 2 / 2 | | 2.2 - 2.3 | 2.3 | 2.2 J | 2.3 J |
| Vanadium | 2 / 2 | | 19 - 22 | 21 | 22 | 19 |
| Zinc | 2 / 2 | | 55 - 73 | 64 | 55 | 73 |
| Chloride | 2 / 2 | | 6.3 - 13 | 9.7 | 6.3 J | 13 |
| Nitrogen, as Ammonia | 2 / 2 | | 14 - 22 | 18 | 14 | 22 |

Table 4.1-10
Summary of Detected Chemicals for Sediment Samples - Detention Basin
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | Range of Detected Concentrations | Average of All Samples | OC-SD-SD-503-XXX SD-503 12/17/2012 | OC-SD-SD-504-XXX SD-504 12/17/2012 |
|------------------------------------|------------------------|---|----------------------------------|------------------------|--|--|
| Oxidation Reduction Potential (mV) | 2 / 2 | | -32 - -31 | -32 | -32 | -31 |
| pH (pH units) | 2 / 2 | | 6.98 - 6.99 | 7.0 | 6.98 | 6.99 |
| Sulfate | 2 / 2 | | 900 - 1900 | 1400 | 900 | 1900 |
| Total Organic Carbon | 2 / 2 | | 60 - 110 | 85 | 110 | 60 |

mg/Kg = milligram per kilogram

mV = millivolts

U = not detected,

value is the reporting limit

J = value is estimated

Prepared by / Date: KJC 03/28/13

Checked by / Date: CTM 03/28/13

Table 4.2-7
Summary of Detected Chemicals for Sediment Samples - Off-Property West Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | | Average of All Samples | OC-SD-OPWD-1-XXX OPWD-1 12/10/2010 0-0.5 ft | OC-SD-OPWD-2-XXX OPWD-2 12/10/2010 0-0.5 ft | OC-SD-OPWD-SD/SO/SW-S-XXX OPWD-SD-S 12/10/2010 0-0.5 ft |
|--------------------------------------|------------------------|---|---|----------------------------------|--------|------------------------|--|--|--|
| Volatile Organics (mg/Kg) | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 1 / 3 | 0.0035 | : | 0.0067 | 0.0038 | - | 0.0038 | 0.0030 | 0.0035 U |
| 2,4,4-Trimethyl-1-pentene | 1 / 3 | 0.007 | : | 0.013 | 0.06 | - | 0.06 | 0.023 | 0.007 U |
| 2,4,4-Trimethyl-2-pentene | 1 / 3 | 0.007 | : | 0.013 | 0.008 | - | 0.008 | 0.0060 | 0.007 U |
| 2-Butanone | 1 / 3 | 0.035 | : | 0.067 | 0.043 | - | 0.043 | 0.031 | 0.035 U |
| Semivolatile Organics (mg/Kg) | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 2 / 3 | 0.056 | : | 0.056 | 0.027 | - | 0.066 | 0.040 | 0.056 U |
| 4-Chlorophenyl phenyl ether | 1 / 3 | 0.056 | : | 0.087 | 0.061 | - | 0.061 | 0.044 | 0.056 U |
| Benzo(a)anthracene | 3 / 3 | | | | 0.098 | - | 0.17 | 0.14 | 0.17 |
| Benzo(a)pyrene | 3 / 3 | | | | 0.14 | - | 0.2 | 0.17 | 0.2 |
| Benzo(b)fluoranthene | 2 / 2 | | | | 0.3 | - | 0.31 | 0.31 | 0.3 |
| Benzo(ghi)perylene | 3 / 3 | | | | 0.12 | - | 0.15 | 0.14 | 0.12 |
| Benzo(k)fluoranthene | 2 / 2 | | | | 0.16 | - | 0.18 | 0.17 | 0.18 |
| Benzoic Acid | 3 / 3 | | | | 0.054 | - | 0.42 | 0.24 | 0.054 J |
| Bis(2-Ethylhexyl)phthalate | 3 / 3 | | | | 0.047 | - | 0.12 | 0.092 | 0.11 |
| Carbazole | 3 / 3 | | | | 0.039 | - | 0.051 | 0.045 | 0.039 J |
| Chrysene | 3 / 3 | | | | 0.21 | - | 0.28 | 0.25 | 0.25 |
| Dibenz(a,h)anthracene | 2 / 2 | | | | 0.035 | - | 0.061 | 0.048 | 0.035 J |
| Diphenyl ether | 2 / 3 | 0.087 | : | 0.087 | 0.094 | - | 0.86 | 0.33 | 0.094 |
| Diphenylmethanone | 2 / 3 | 0.087 | : | 0.087 | 0.028 | - | 0.2 | 0.091 | 0.028 J |
| Fluoranthene | 3 / 3 | | | | 0.34 | - | 0.59 | 0.46 | 0.44 |
| Indeno(1,2,3-cd)pyrene | 3 / 3 | | | | 0.12 | - | 0.14 | 0.13 | 0.12 |
| N-Nitrosodiphenylamine | 2 / 3 | 0.087 | : | 0.087 | 0.098 | - | 0.8 | 0.31 | 0.098 |
| Phenanthrene | 3 / 3 | | | | 0.1 | - | 0.18 | 0.13 | 0.12 |
| Pyrene | 3 / 3 | | | | 0.35 | - | 0.44 | 0.40 | 0.42 |
| Inorganics (mg/Kg) | | | | | | | | | |
| Aluminum | 3 / 3 | | | | 13000 | - | 24000 | 17000 | 13000 |
| Arsenic | 3 / 3 | | | | 6.7 | - | 14 | 10.0 | 14 |
| Barium | 3 / 3 | | | | 9.1 | - | 16 | 11.7 | 9.1 J |
| Beryllium | 3 / 3 | | | | 1.1 | - | 1.4 | 1.2 | 1.1 |
| Cadmium | 3 / 3 | | | | 0.099 | - | 0.62 | 0.35 | 0.33 J |
| Calcium | 3 / 3 | | | | 480 | - | 2000 | 1110 | 480 J |
| Chromium | 3 / 3 | | | | 250 | - | 2400 | 1350 | 1400 |
| Cobalt | 3 / 3 | | | | 3.2 | - | 15 | 7.5 | 4.4 |
| Copper | 3 / 3 | | | | 16 | - | 39 | 25 | 16 |
| Iron | 3 / 3 | | | | 6300 | - | 13000 | 9233 | 8400 |
| Lead | 3 / 3 | | | | 8 | - | 14 | 12.0 | 8 |
| Magnesium | 3 / 3 | | | | 830 | - | 1100 | 977 | 830 J |
| | | | | | | | | | 1100 J |
| | | | | | | | | | 1000 J |

Table 4.2-7
Summary of Detected Chemicals for Sediment Samples - Off-Property West Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | | Average of All Samples | OC-SD-OPWD-1-XXX OPWD-1 12/10/2010 0-0.5 ft | OC-SD-OPWD-2-XXX OPWD-2 12/10/2010 0-0.5 ft | OC-SD-OPWD-SD/SO/SW-S-XXX OPWD-SD-S 12/10/2010 0-0.5 ft |
|------------------------------------|------------------------|---|---|----------------------------------|-----------------|------------------------|--|--|--|
| Manganese | 3 / 3 | | | 40 - 160 | | 85 | 40 J | 55 J | 160 J |
| Nickel | 3 / 3 | | | 10 - 15 | | 12.3 | 12 | 10 | 15 J |
| Potassium | 3 / 3 | | | 1200 - 1900 | | 1500 | 1900 | 1200 | 1400 J |
| Silver | 3 / 3 | | | 3.7 - 41 | | 24 | 26 | 3.7 | 41 J |
| Sodium | 3 / 3 | | | 74 - 360 | | 174 | 74 J | 88 J | 360 J |
| Vanadium | 3 / 3 | | | 9.2 - 15 | | 11.7 | 9.2 | 15 | 11 J |
| Zinc | 3 / 3 | | | 23 - 100 | | 49 | 23 J | 24 J | 100 J |
| Chloride | 3 / 3 | | | 91 - 240 | | 147 | 110 | 91 | 240 |
| Nitrogen, as Ammonia | 3 / 3 | | | 93 - 540 | | 254 | 93 J | 130 J | 540 J |
| Oxidation Reduction Potential (mV) | 1 / 1 | | | 150 - 150 | | 150 | | | 150 |
| pH (pH units) | 1 / 1 | | | 7.19 - 7.19 | | 7.2 | | | 7.19 HF |
| Sulfate | 3 / 3 | | | 280 - 1500 | | 697 | 310 | 280 | 1500 |
| Total Organic Carbon | 3 / 3 | | | 13000 - 34000 | | 25000 | 13000 | 28000 | 34000 |
| Specialty Compounds (mg/Kg) | | | | | | | | | |
| Hydrazine | 1 / 2 | 0.0041 | : | 0.0041 | 0.0013 - 0.0013 | 0.0017 | 0.0013 J | 0.0041 U | |
| Formaldehyde | 2 / 2 | | | | 0.4 - 0.61 | 0.51 | 0.4 | 0.61 | |

mg/Kg = milligram per kilogram

mV = millivolts

U = not detected,

value is the reporting limit

J = value is estimated

R = value is rejected

HF = holding time exceeded

Prepared by / Date: KJC 03/28/13

Checked by / Date: CTM 03/28/13

Table 4.2-8
Summary of Detected Chemicals for Sediment Samples - East Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | | Average of All Samples | East Ditch Background (1) (mg/Kg) | | OC-SD-EDSD/SW2 (EDBS6)-XXX | OC-SD-EDSD/SW7-XXX EDSD/SW7 (EDBS6) | OC-SD-EDSD/SW7-XXX EDSD/SW7 (EDBS6) |
|---------------------------------------|------------------------|---|---|----------------------------------|--------|------------------------|-----------------------------------|---------------------|----------------------------|-------------------------------------|-------------------------------------|
| | | | | | | | 12/13/2010 0-0.33 ft | 11/6/2012 0.5 ft | 11/6/2012 0.5 ft | 6/18/2012 0-0.5 ft | |
| Volatile Organics (mg/Kg) | | | | | | | | | | | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 1 / 3 | 0.013 | : | 0.05 | 0.0041 | - 0.0041 | 0.012 | | 0.05 UJ | 0.0041 | 0.013 U |
| 2,4,4-Trimethyl-2-pentene | 1 / 3 | 0.005 | : | 0.02 | 0.0016 | - 0.0016 | 0.0047 | | 0.02 UJ | 0.0016 J | 0.005 U |
| 2-Butanone | 1 / 3 | 0.025 | : | 0.029 | 0.097 | - 0.097 | 0.041 | | 0.097 J | 0.029 U | 0.025 U |
| Acetone | 1 / 3 | 0.25 | : | 0.29 | 0.43 | - 0.43 | 0.23 | | 0.43 J | 0.29 U | 0.25 UJ |
| Trichloroethene | 1 / 3 | 0.0025 | : | 0.0099 | 0.0017 | - 0.0017 | 0.0026 | | 0.0099 UJ | 0.0017 J | 0.0025 U |
| Semivolatile Organics (mg/Kg) | | | | | | | | | | | |
| 2-Methylnaphthalene | 1 / 3 | 0.042 | : | 0.6 | 0.078 | - 0.078 | 0.13 | | 0.078 J | 0.042 U | 0.6 U |
| Acenaphthene | 2 / 3 | 0.6 | : | 0.6 | 0.019 | - 0.14 | 0.15 | 0.00011 J | 0.14 J | 0.019 J | 0.6 U |
| Anthracene | 2 / 3 | 0.6 | : | 0.6 | 0.04 | - 0.27 | 0.20 | | 0.27 J | 0.04 J | 0.6 U |
| Benzo(a)anthracene | 3 / 3 | | | | 0.25 | - 0.77 | 0.55 | | 0.77 J | 0.25 | 0.63 J |
| Benzo(a)pyrene | 3 / 3 | | | | 0.24 | - 0.94 | 0.62 | 0.000094 J | 0.94 J | 0.24 | 0.67 |
| Benzo(b)fluoranthene | 3 / 3 | | | | 0.43 | - 1.6 | 1.0 | | 1.6 J | 0.43 | 1 J |
| Benzo(ghi)perylene | 3 / 3 | | | | 0.11 | - 0.56 | 0.40 | 0.00014 J | 0.56 J | 0.11 | 0.54 J |
| Benzo(k)fluoranthene | 3 / 3 | | | | 0.17 | - 0.53 | 0.38 | | 0.53 J | 0.17 | 0.45 J |
| Benzoic Acid | 2 / 3 | | 3 | : | 3 | 0.16 | - 0.49 | 0.72 | 0.0021 J | 0.49 J | 0.16 J |
| Bis(2-Ethylhexyl)phthalate | 3 / 3 | | | | 0.96 | - 10 | 4.2 | 0.00046 J | 10 J | 0.96 J | 1.5 |
| Carbazole | 2 / 3 | 0.6 | : | 0.6 | 0.063 | - 0.24 | 0.20 | | 0.24 J | 0.063 | 0.6 U |
| Chrysene | 3 / 3 | | | | 0.38 | - 1.3 | 0.89 | | 1.3 J | 0.38 | 1 |
| Dibenz(a,h)anthracene | 1 / 3 | 0.2 | : | 0.6 | 0.037 | - 0.037 | 0.15 | 0.00014 J | 0.2 UJ | 0.037 J | 0.6 U |
| Dibenzofuran | 1 / 3 | 0.042 | : | 0.6 | 0.15 | - 0.15 | 0.16 | | 0.15 J | 0.042 U | 0.6 U |
| Diphenyl ether | 1 / 3 | 0.042 | : | 0.6 | 0.28 | - 0.28 | 0.20 | | 0.28 J | 0.042 U | 0.6 U |
| Fluoranthene | 3 / 3 | | | | 0.64 | - 2.7 | 1.7 | | 2.7 J | 0.64 | 1.8 J |
| Fluorene | 2 / 3 | 0.6 | : | 0.6 | 0.02 | - 0.23 | 0.18 | | 0.23 J | 0.02 J | 0.6 U |
| Indeno(1,2,3-cd)pyrene | 3 / 3 | | | | 0.11 | - 0.53 | 0.37 | 0.00016 J | 0.53 J | 0.11 | 0.48 J |
| Naphthalene | 1 / 2 | 0.6 | : | 0.6 | 0.11 | - 0.11 | 0.21 | | 0.11 J | | 0.6 U |
| N-Nitrosodiphenylamine | 1 / 3 | 0.042 | : | 0.6 | 0.21 | - 0.21 | 0.18 | | 0.21 J | 0.042 UJ | 0.6 U |
| Phenanthrene | 3 / 3 | | | | 0.31 | - 1.3 | 0.75 | | 1.3 J | 0.31 | 0.64 |
| Phenol | 1 / 3 | 0.2 | : | 0.6 | 0.026 | - 0.026 | 0.14 | | 0.2 UJ | 0.026 J | 0.6 U |
| Pyrene | 3 / 3 | | | | 0.43 | - 2.3 | 1.3 | | 2.3 J | 0.43 | 1.1 |
| Inorganics (mg/Kg) | | | | | | | | | | | |
| Aluminum | 3 / 3 | | | | 3800 | - 6400 | 5367 | 1.1 | 6400 J | 3800 J | 5900 |
| Antimony | 2 / 3 | 3.4 | : | 3.4 | 0.89 | - 4 | 2.2 | | 3.4 UJ | 0.89 | 4 |
| Arsenic | 3 / 3 | | | | 26 | - 450 | 178 | 0.0036 J | 450 J | 26 | 57 |
| Barium | 3 / 3 | | | | 42 | - 150 | 111 | 0.2 | 150 J | 42 J | 140 |
| Beryllium | 2 / 3 | 1.4 | : | 1.4 | 0.2 | - 1.6 | 0.83 | | 1.4 UJ | 1.6 | 0.2 J |

Table 4.2-8
Summary of Detected Chemicals for Sediment Samples - East Ditch
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | Range of Detected Concentrations | Average of All Samples | East Ditch Background (1) (mg/Kg) | OC-SD-EDSD/SW2 (EDBS6)-XXX | OC-SD-EDSD/SW7-XXX | OC-SD-EDSD/SW7-XXX |
|------------------------------------|------------------------|---|----------------------------------|------------------------|-----------------------------------|----------------------------|---------------------|-----------------------|
| | | | | | | 12/13/2010 0-0.33 ft | 11/6/2012 0.5 ft | 6/18/2012 0-0.5 ft |
| Cadmium | 3 / 3 | | 0.84 - 3.7 | 2.2 | 0.0011 J | 2.2 J | 3.7 | 0.84 |
| Calcium | 3 / 3 | | 1500 - 7900 | 3767 | 79 | 7900 J | 1900 | 1500 |
| Chromium | 3 / 3 | | 31 - 78 | 49 | 0.0022 J | 31 J | 78 J | 39 |
| Cobalt | 3 / 3 | | 7.2 - 30 | 16.7 | 0.003 J | 30 J | 13 | 7.2 |
| Copper | 3 / 3 | | 110 - 270 | 170 | 0.027 | 110 J | 130 J | 270 |
| Iron | 3 / 3 | | 21000 - 210000 | 90667 | 6.7 | 210000 J | 21000 | 41000 |
| Lead | 3 / 3 | | 25 - 340 | 168 | 0.014 | 25 J | 140 J | 340 |
| Magnesium | 3 / 3 | | 1400 - 3300 | 2233 | 7.7 | 1400 J | 2000 J | 3300 |
| Manganese | 3 / 3 | | 230 - 3200 | 1343 | 3.4 | 3200 J | 600 | 230 |
| Mercury | 2 / 3 | 0.33 : 0.33 | 0.026 - 0.04 | 0.077 | | 0.33 UJ | 0.026 J | 0.04 J |
| Nickel | 3 / 3 | | 19 - 29 | 23 | 0.0037 J | 21 J | 29 J | 19 |
| Potassium | 2 / 3 | 1400 : 1400 | 290 - 620 | 537 | 9.6 | 1400 UJ | 620 J | 290 J |
| Silver | 2 / 3 | 3.4 : 3.4 | 0.27 - 2.6 | 1.5 | | 3.4 UJ | 0.27 J | 2.6 |
| Sodium | 3 / 3 | | 160 - 340 | 227 | 450 | 340 J | 160 | 180 J |
| Tin | 1 / 2 | 12 : 12 | 8.6 - 8.6 | 7.3 | | 8.6 J | | 12 U |
| Vanadium | 3 / 3 | | 15 - 120 | 50 | 0.0022 J | 120 J | 15 | 16 |
| Zinc | 3 / 3 | | 450 - 1900 | 967 | 0.023 J | 550 J | 1900 | 450 |
| Chloride | 3 / 3 | | 26 - 690 | 257 | 930 | 690 | 26 | 55 |
| Nitrogen, as Ammonia | 3 / 3 | | 8.5 - 130 | 50 | 0.4 | 130 | 8.5 | 10 |
| Sulfate | 1 / 3 | 48 : 160 | 71 - 71 | 58 | 16 | 160 U | 71 | 48 U |
| Total Organic Carbon | 3 / 3 | | 28 - 86000 | 31609 | 12 | 86000 | 28 | 8800 |
| Specialty Compounds (mg/Kg) | | | | | | | | |
| Hydrazine | 1 / 2 | 0.0026 : 0.0026 | 0.0014 - 0.0014 | 0.0014 | | | 0.0026 U | 0.0014 J |
| Acetaldehyde | 1 / 2 | 0.24 : 0.24 | 0.055 - 0.055 | 0.088 | | | 0.055 J | 0.24 UJ |
| Formaldehyde | 2 / 2 | | 0.72 - 1.1 | 0.91 | | | 1.1 J | 0.72 |

Notes:

(1) Background location identified for the East Ditch is located at SDBK-001.

mg/Kg = milligram per kilogram

U = not detected,

value is the reporting limit

J = value is estimated

Prepared by / Date: KJC 03/04/14

Checked by / Date: CTM 03/10/14

Table 4.2-9
Summary of Detected Chemicals for Sediment Samples - Landfill Brook
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | | Average of All Samples | OC-SD-LB-1-XXX LB-1 12/9/2010 0-0.5 ft | OC-SD-LB-2-XXX LB-2 12/9/2010 0-0.5 ft | OC-SD-LB-3-XXX LB-3 12/9/2010 0-0.5 ft |
|--------------------------------------|------------------------|---|---------|----------------------------------|----------|------------------------|---|---|---|
| Volatile Organics (mg/Kg) | | | | | | | | | |
| 1,2-Dichlorobenzene | 1 / 3 | 0.0044 | : 0.005 | 0.031 | - 0.031 | 0.012 | 0.0044 U | 0.005 U | 0.031 |
| 2-Butanone | 1 / 3 | 0.044 | : 0.05 | 0.069 | - 0.069 | 0.039 | 0.044 U | 0.05 U | 0.069 |
| Chlorobenzene | 1 / 3 | 0.0044 | : 0.005 | 0.059 | - 0.059 | 0.021 | 0.0044 U | 0.005 U | 0.059 |
| sec-Butylbenzene | 1 / 3 | 0.0044 | : 0.005 | 0.0046 | - 0.0046 | 0.0031 | 0.0044 U | 0.005 U | 0.0046 J |
| Semivolatile Organics (mg/Kg) | | | | | | | | | |
| Benzo(a)anthracene | 1 / 3 | 0.29 | : 0.32 | 1.4 | - 1.4 | 0.57 | 0.29 U | 0.32 U | 1.4 J |
| Benzo(a)pyrene | 1 / 3 | 0.29 | : 0.32 | 1.5 | - 1.5 | 0.60 | 0.29 U | 0.32 U | 1.5 J |
| Benzo(b)fluoranthene | 2 / 3 | 0.32 | : 0.32 | 0.11 | - 2 | 0.76 | 0.11 J | 0.32 U | 2 J |
| Benzo(ghi)perylene | 2 / 3 | 0.32 | : 0.32 | 0.096 | - 1.6 | 0.62 | 0.096 J | 0.32 U | 1.6 J |
| Bis(2-Ethylhexyl)phthalate | 3 / 3 | | | 0.16 | - 4.7 | 1.8 | 0.39 | 0.16 J | 4.7 |
| Chrysene | 1 / 3 | 0.29 | : 0.32 | 1.8 | - 1.8 | 0.70 | 0.29 U | 0.32 U | 1.8 J |
| Fluoranthene | 3 / 3 | | | 0.095 | - 3.5 | 1.2 | 0.095 J | 0.11 J | 3.5 J |
| Indeno(1,2,3-cd)pyrene | 1 / 3 | 0.29 | : 0.32 | 1.4 | - 1.4 | 0.57 | 0.29 U | 0.32 U | 1.4 J |
| N-Nitrosodiphenylamine | 1 / 3 | 0.29 | : 0.32 | 2 | - 2 | 0.77 | 0.29 U | 0.32 U | 2 J |
| Phenanthrene | 1 / 3 | 0.35 | : 0.39 | 1.1 | - 1.1 | 0.49 | 0.35 U | 0.39 U | 1.1 J |
| Pyrene | 2 / 3 | 0.32 | : 0.32 | 0.12 | - 2.9 | 1.1 | 0.12 J | 0.32 U | 2.9 J |
| Inorganics (mg/Kg) | | | | | | | | | |
| Aluminum | 3 / 3 | | | 3800 | - 12000 | 8200 | 8800 | 3800 | 12000 |
| Arsenic | 3 / 3 | | | 5.5 | - 35 | 15.5 | 5.9 | 5.5 | 35 |
| Barium | 3 / 3 | | | 9.4 | - 94 | 46 | 35 J | 9.4 J | 94 J |
| Beryllium | 3 / 3 | | | 0.11 | - 0.3 | 0.22 | 0.25 J | 0.11 J | 0.3 J |
| Cadmium | 3 / 3 | | | 0.15 | - 1 | 0.64 | 0.76 | 0.15 J | 1 |
| Calcium | 3 / 3 | | | 1000 | - 4700 | 2433 | 1600 J | 1000 J | 4700 J |
| Chromium | 3 / 3 | | | 20 | - 130 | 58 | 24 | 20 | 130 |
| Cobalt | 3 / 3 | | | 0.65 | - 7.2 | 3.3 | 2.1 | 0.65 J | 7.2 |
| Copper | 3 / 3 | | | 4.9 | - 61 | 30 | 24 | 4.9 | 61 |
| Iron | 3 / 3 | | | 3100 | - 25000 | 12167 | 8400 | 3100 | 25000 |
| Lead | 3 / 3 | | | 19 | - 260 | 133 | 260 | 19 | 120 |
| Magnesium | 3 / 3 | | | 330 | - 3700 | 1943 | 1800 J | 330 J | 3700 J |
| Manganese | 3 / 3 | | | 75 | - 380 | 184 | 75 J | 96 J | 380 J |
| Mercury | 2 / 3 | 0.12 | : 0.12 | 0.14 | - 1.2 | 0.47 | 0.14 | 0.12 U | 1.2 |
| Nickel | 3 / 3 | | | 1.8 | - 19 | 10.0 | 9.3 | 1.8 J | 19 |
| Potassium | 3 / 3 | | | 240 | - 1900 | 943 | 690 | 240 J | 1900 |
| Silver | 3 / 3 | | | 0.2 | - 1.6 | 0.68 | 0.2 J | 0.23 J | 1.6 |
| Sodium | 3 / 3 | | | 45 | - 220 | 132 | 220 | 45 J | 130 J |
| Tin | 1 / 3 | | 10 : 11 | 6.8 | - 6.8 | 5.8 | 11 U | 10 U | 6.8 J |
| Vanadium | 3 / 3 | | | 5.5 | - 29 | 18.8 | 22 | 5.5 | 29 |
| Zinc | 3 / 3 | | | 22 | - 190 | 107 | 110 J | 22 J | 190 J |

Table 4.2-9
Summary of Detected Chemicals for Sediment Samples - Landfill Brook
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | | Range of Detected Concentrations | Average of All Samples | OC-SD-LB-1-XXX 12/9/2010 0-0.5 ft | OC-SD-LB-2-XXX 12/9/2010 0-0.5 ft | OC-SD-LB-3-XXX 12/9/2010 0-0.5 ft |
|----------------------|------------------------|---|--|----------------------------------|------------------------|---|---|---|
| Chloride | 3 / 3 | | | 61 - 150 | 107 | 110 | 61 | 150 |
| Nitrogen, as Ammonia | 3 / 3 | | | 120 - 580 | 280 | 140 J | 120 J | 580 J |
| Sulfate | 3 / 3 | | | 78 - 310 | 166 | 78 | 110 | 310 |
| Total Organic Carbon | 3 / 3 | | | 33000 - 51000 | 41667 | 33000 | 41000 | 51000 |

mg/Kg = milligram per kilogram

U = not detected,

value is the reporting limit

J = value is estimated

Prepared by / Date: KJC 03/28/13

Checked by / Date: CTM 03/28/13

Table 4.2-10
Summary of Detected Chemicals for Sediment Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | Range of Detected Concentrations | | Average of All Samples | Maple Meadow Brook Wetland Background (1) (mg/Kg) | OC-SD-MMB-SW/SD-10-XXX MMB-SW/SD-10 12/2/2010 0-0.5 ft | OC-SD-MMB-SW/SD-11-XXX MMB-SW/SD-11 12/2/2010 0-0.5 ft | OC-SD-MMB-SW/SD-1-XXX MMB-SW/SD-1 12/1/2010 0-0.5 ft |
|--------------------------------------|------------------------|---|----------------------------------|---------|------------------------|---|---|---|---|
| Volatile Organics (mg/Kg) | | | | | | | | | |
| 2-Butanone | 12 / 13 | 0.028 : 0.028 | 0.021 | - 0.5 | 0.22 | 0.61 J | 0.29 J | 0.44 J | 0.021 J |
| Acetone | 13 / 13 | | 0.035 | - 1.7 | 0.73 | 2 J | 0.92 J | 1.3 J | 0.075 J |
| Semivolatile Organics (mg/Kg) | | | | | | | | | |
| 3 & 4 Methylphenol | 2 / 13 | 0.045 : 0.31 | 0.2 | - 0.32 | 0.12 | | 0.24 UJ | 0.23 UJ | 0.32 |
| 4-Nitrophenol | 1 / 13 | 0.22 : 1.6 | 0.091 | - 0.091 | 0.43 | | 1.2 UJ | 1.2 UJ | 0.26 U |
| Anthracene | 1 / 13 | 0.045 : 0.31 | 0.082 | - 0.082 | 0.093 | | 0.24 UJ | 0.23 UJ | 0.053 U |
| Benzaldehyde | 4 / 13 | 0.045 : 0.31 | 0.056 | - 0.3 | 0.11 | 0.33 J | 0.3 J | 0.23 UJ | 0.053 U |
| Benzo(a)anthracene | 3 / 13 | 0.045 : 0.31 | 0.082 | - 0.4 | 0.13 | 0.081 J | 0.24 UJ | 0.23 UJ | 0.053 U |
| Benzo(a)pyrene | 6 / 13 | 0.045 : 0.31 | 0.052 | - 0.4 | 0.12 | 0.096 J | 0.24 UJ | 0.23 UJ | 0.053 U |
| Benzo(b)fluoranthene | 6 / 13 | 0.045 : 0.31 | 0.067 | - 0.56 | 0.16 | | 0.24 UJ | 0.23 UJ | 0.053 U |
| Benzo(ghi)perylene | 6 / 13 | 0.045 : 0.27 | 0.081 | - 0.32 | 0.11 | 0.087 J | 0.24 UJ | 0.23 UJ | 0.053 U |
| Benzo(k)fluoranthene | 4 / 13 | 0.045 : 0.31 | 0.071 | - 0.21 | 0.11 | | 0.24 UJ | 0.23 UJ | 0.053 U |
| Benzoic Acid | 13 / 13 | | 0.21 | - 1.4 | 0.58 | 0.54 J | 0.52 J | 0.83 J | 0.3 |
| Benzyl alcohol | 1 / 13 | 0.089 : 0.62 | 0.35 | - 0.35 | 0.20 | | 0.48 UJ | 0.47 UJ | 0.11 U |
| Bis(2-Ethylhexyl)phthalate | 10 / 13 | 0.2 : 0.31 | 0.05 | - 0.35 | 0.15 | 0.26 J | 0.25 J | 0.096 J | 0.05 J |
| Caprolactam | 1 / 9 | 0.045 : 0.31 | 0.088 | - 0.088 | 0.078 | | R | 0.23 UJ | 0.053 U |
| Carbazole | 2 / 13 | 0.045 : 0.31 | 0.025 | - 0.097 | 0.093 | | 0.24 UJ | 0.23 UJ | 0.053 U |
| Chrysene | 7 / 13 | 0.045 : 0.31 | 0.073 | - 0.48 | 0.13 | 0.14 J | 0.24 UJ | 0.086 J | 0.053 U |
| Dibenz(a,h)anthracene | 4 / 13 | 0.045 : 0.31 | 0.041 | - 0.15 | 0.094 | | 0.24 UJ | 0.23 UJ | 0.053 U |
| Fluoranthene | 9 / 13 | 0.045 : 0.31 | 0.079 | - 0.88 | 0.20 | 0.22 J | 0.1 J | 0.13 J | 0.053 U |
| Indeno(1,2,3-cd)pyrene | 6 / 13 | 0.045 : 0.27 | 0.095 | - 0.34 | 0.12 | 0.085 J | 0.24 UJ | 0.23 UJ | 0.053 U |
| Naphthalene | 1 / 13 | 0.11 : 0.75 | 0.12 | - 0.12 | 0.22 | | 0.57 UJ | 0.56 UJ | 0.13 U |
| Phenanthrene | 6 / 13 | 0.054 : 0.37 | 0.069 | - 0.45 | 0.14 | 0.14 J | 0.29 UJ | 0.28 UJ | 0.063 U |
| Pyrene | 9 / 13 | 0.045 : 0.31 | 0.071 | - 0.85 | 0.21 | 0.28 J | 0.11 J | 0.13 J | 0.053 U |
| Inorganics (mg/Kg) | | | | | | | | | |
| Aluminum | 13 / 13 | | 5400 | - 28000 | 13162 | 5500 J | 6700 J | 14000 J | 8200 |
| Arsenic | 13 / 13 | | 3.5 | - 52 | 17.3 | 6.6 J | 15 J | 22 J | 4.5 |
| Barium | 13 / 13 | | 22 | - 190 | 103 | 84 J | 140 J | 120 J | 33 |
| Beryllium | 13 / 13 | | 0.17 | - 2.7 | 0.99 | 0.7 J | 0.34 J | 1.5 J | 0.17 J |
| Cadmium | 13 / 13 | | 0.082 | - 4.9 | 2.1 | 0.9 J | 1.9 J | 4.6 J | 0.11 J |
| Calcium | 13 / 13 | | 930 | - 10000 | 6187 | 9400 J | 8800 J | 10000 J | 1200 |
| Chromium | 13 / 13 | | 7.5 | - 42 | 22 | 7.3 J | 16 J | 27 J | 29 J |
| Cobalt | 13 / 13 | | 2.3 | - 35 | 12.8 | 4.2 J | 10 J | 19 J | 2.8 |
| Copper | 13 / 13 | | 7.4 | - 90 | 39 | 15 J | 45 J | 53 J | 7.8 |
| Iron | 13 / 13 | | 6400 | - 95000 | 25662 | 7500 J | 20000 J | 36000 J | 12000 |
| Lead | 13 / 13 | | 7.2 | - 470 | 142 | 46 J | 150 J | 160 J | 7.2 |
| Magnesium | 13 / 13 | | 940 | - 4500 | 2126 | 930 J | 940 J | 2400 J | 4500 |

Table 4.2-10
Summary of Detected Chemicals for Sediment Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | Frequency of Detection | Range of Reporting Limits for Non Detects | Range of Detected Concentrations | Average of All Samples | Maple Meadow Brook Wetland Background (1) (mg/Kg) | OC-SD-MMB-SW/SD-10-XXX MMB-SW/SD-10 12/2/2010 0-0.5 ft | OC-SD-MMB-SW/SD-11-XXX MMB-SW/SD-11 12/2/2010 0-0.5 ft | OC-SD-MMB-SW/SD-1-XXX MMB-SW/SD-1 12/1/2010 0-0.5 ft |
|------------------------------------|------------------------|---|----------------------------------|------------------------|---|---|---|---|
| Manganese | 13 / 13 | | 110 - 2100 | 790 | 500 J | 890 J | 1400 J | 130 |
| Mercury | 8 / 13 | 0.095 : 0.47 | 0.027 - 0.51 | 0.26 | | 0.45 J | 0.44 UJ | 0.095 U |
| Nickel | 13 / 13 | | 5.4 - 45 | 18.8 | 6.1 J | 15 J | 24 J | 16 J |
| Potassium | 13 / 13 | | 410 - 2900 | 1108 | 640 J | 410 J | 1100 J | 1900 |
| Selenium | 1 / 13 | 0.75 : 4.3 | 1.2 - 1.2 | 1.4 | | 4 UJ | 4.1 UJ | 0.94 U |
| Silver | 1 / 13 | 0.75 : 4.3 | 0.74 - 0.74 | 1.4 | | 4 UJ | 4.1 UJ | 0.94 U |
| Sodium | 13 / 13 | | 51 - 940 | 509 | 430 J | 800 J | 840 J | 69 J |
| Thallium | 1 / 13 | 1.5 : 8.6 | 1.4 - 1.4 | 2.6 | | 8 UJ | 8.2 UJ | 1.9 U |
| Tin | 9 / 13 | 7.5 : 34 | 0.85 - 16 | 8.2 | 7.3 J | 10 J | 7.4 J | 9.4 U |
| Vanadium | 13 / 13 | | 8.9 - 61 | 32 | 11 J | 44 J | 44 J | 17 |
| Zinc | 13 / 13 | | 22 - 500 | 211 | 73 J | 190 J | 320 J | 34 |
| Chloride | 13 / 13 | | 34 - 1000 | 486 | 420 | | 930 | 760 |
| Nitrogen, as Ammonia | 13 / 13 | | 62 - 1500 | 576 | 830 J | 1500 J | 490 J | 96 J |
| Sulfate | 11 / 13 | 63 : 75 | 120 - 1400 | 600 | 420 J | 1400 J | 980 J | 63 UJ |
| Total Organic Carbon | 13 / 13 | | 10000 - 310000 | 174308 | 370000 J | 270000 J | 270000 J | 10000 J |
| Specialty Compounds (mg/Kg) | | | | | | | | |
| Acetaldehyde | 6 / 11 | 0.27 : 1.5 | 0.22 - 0.42 | 0.36 | | 0.22 J | 1.5 U | 0.32 UJ |
| Formaldehyde | 11 / 11 | | 0.31 - 4 | 2.2 | | 2.6 | 2.4 J | 0.34 J |

Notes:

(1) Background location identified for the Maple Meadow Brook Wetland is located at SDBK-004.

mg/Kg = milligram per kilogram

U = not detected,

value is the reporting limit

J = value is estimated

R = value is rejected

B = compound was found in the blank and sample

* = LCS or LCSD exceeds the control limits

Table 4.2-10
Summary of Detected Chemicals for Sediment Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SD-MMB-SW/SD-1-XXX MMB-SW/SD-1 2/17/2011 0-0.5 ft | OC-SD-MMB-SW/SD-2-XXX MMB-SW/SD-2 12/3/2010 0-0.5 ft | OC-SD-MMB-SW/SD-3-XXX MMB-SW/SD-3 12/3/2010 0-0.5 ft | OC-SD-MMB-SW/SD-4-XXX MMB-SW/SD-4 12/2/2010 0-0.5 ft | OC-SD-MMB-SW/SD-5-XXX MMB-SW/SD-5 12/2/2010 0-0.5 ft | OC-SD-MMB-SW/SD-6-XXX MMB-SW/SD-6 12/3/2010 0-0.5 ft | OC-SD-MMB-SW/SD-8A-XXX MMB-SW/SD-8A 12/2/2010 0-0.5 ft | OC-SD-MMB-SW/SD-8-XXX MMB-SW/SD-8 12/2/2010 0-0.5 ft |
|--------------------------------------|---|---|---|---|---|---|---|---|
| Volatile Organics (mg/Kg) | | | | | | | | |
| 2-Butanone | 0.086 | 0.34 J | 0.2 J | 0.5 J | 0.25 J | 0.14 J | 0.2 J | 0.29 J |
| Acetone | 0.24 J* | 1.1 J | 0.73 J | 1.7 J | 0.83 J | 0.49 J | 0.66 J | 1 J |
| Semivolatile Organics (mg/Kg) | | | | | | | | |
| 3 & 4 Methylphenol | 0.31 U | 0.23 UJ | 0.27 UJ | 0.2 J | 0.23 UJ | 0.16 UJ | 0.21 UJ | 0.16 UJ |
| 4-Nitrophenol | 1.6 U | 1.2 UJ | 1.3 UJ | 1 UJ | 0.091 J | 0.78 UJ | 1.1 UJ | 0.82 UJ |
| Anthracene | 0.31 U | 0.23 UJ | 0.27 UJ | 0.2 UJ | 0.23 UJ | 0.082 J | 0.21 UJ | 0.16 UJ |
| Benzaldehyde | 0.31 U | 0.23 UJ | 0.27 UJ | 0.2 UJ | 0.13 J | 0.16 UJ | 0.21 UJ | 0.14 J |
| Benzo(a)anthracene | 0.31 U | 0.23 UJ | 0.27 UJ | 0.2 UJ | 0.23 UJ | 0.4 J | 0.17 J | 0.16 UJ |
| Benzo(a)pyrene | 0.31 U | 0.23 UJ | 0.084 J | 0.2 UJ | 0.08 J | 0.4 J | 0.22 J | 0.052 J |
| Benzo(b)fluoranthene | 0.31 U | 0.23 UJ | 0.11 J | 0.2 UJ | 0.14 J | 0.56 J | 0.37 J | 0.067 J |
| Benzo(ghi)perylene | 0.1 JB | 0.23 UJ | 0.27 UJ | 0.2 UJ | 0.093 J | 0.32 J | 0.16 J | 0.081 J |
| Benzo(k)fluoranthene | 0.31 U | 0.23 UJ | 0.27 UJ | 0.2 UJ | 0.15 J | 0.21 J | 0.15 J | 0.16 UJ |
| Benzoic Acid | 1.4 J | 0.27 J | 0.34 J | 0.97 J | 0.74 J | 0.6 J | 0.28 J | 0.76 J |
| Benzyl alcohol | 0.62 U | 0.46 UJ | 0.53 UJ | 0.4 UJ | 0.47 UJ | 0.35 J | 0.42 UJ | 0.33 UJ |
| Bis(2-Ethylhexyl)phthalate | 0.31 U | 0.21 J | 0.27 UJ | 0.2 UJ | 0.089 J | 0.35 J | 0.2 J | 0.056 J |
| Caprolactam | 0.31 U | R | R | 0.2 UJ | 0.088 J | 0.16 UJ | R | 0.16 UJ |
| Carbazole | 0.31 U | 0.23 UJ | 0.27 UJ | 0.2 UJ | 0.23 UJ | 0.097 J | 0.21 UJ | 0.16 UJ |
| Chrysene | 0.31 U | 0.23 UJ | 0.094 J | 0.2 UJ | 0.085 J | 0.48 J | 0.26 J | 0.073 J |
| Dibenz(a,h)anthracene | 0.31 U | 0.23 UJ | 0.27 UJ | 0.2 UJ | 0.083 J | 0.15 J | 0.21 UJ | 0.059 J |
| Fluoranthene | 0.31 U | 0.079 J | 0.19 J | 0.2 UJ | 0.13 J | 0.88 J | 0.42 J | 0.11 J |
| Indeno(1,2,3-cd)pyrene | 0.095 JB | 0.23 UJ | 0.27 UJ | 0.2 UJ | 0.13 J | 0.34 J | 0.16 J | 0.095 J |
| Naphthalene | 0.75 U | 0.55 UJ | 0.64 UJ | 0.48 UJ | 0.56 UJ | 0.12 J | 0.5 UJ | 0.39 UJ |
| Phenanthrene | 0.37 U | 0.28 UJ | 0.11 J | 0.24 UJ | 0.079 J | 0.45 J | 0.17 J | 0.069 J |
| Pyrene | 0.31 U | 0.071 J | 0.2 J | 0.2 UJ | 0.15 J | 0.85 J | 0.49 J | 0.15 J |
| Inorganics (mg/Kg) | | | | | | | | |
| Aluminum | 6000 | 14000 J | 8300 J | 8500 J | 17000 J | 28000 J | 20000 J | 28000 J |
| Arsenic | 3.5 | 20 J | 14 J | 8.2 J | 20 J | 52 J | 30 J | 25 J |
| Barium | 26 | 130 J | 96 J | 68 J | 150 J | 190 J | 150 J | 170 J |
| Beryllium | 0.23 J | 0.72 J | 0.6 J | 1 J | 2.1 J | 0.72 J | 2.4 J | 2.7 J |
| Cadmium | 0.31 J | 1.5 J | 2.4 J | 0.87 J | 2.8 J | 2.3 J | 4.6 J | 4.9 J |
| Calcium | 1500 B | 8700 J | 9700 J | 9800 J | 8100 J | 8200 J | 5300 J | 6100 J |
| Chromium | 11 | 20 J | 16 J | 8.5 J | 24 J | 40 J | 38 J | 42 J |
| Cobalt | 2.3 | 9.2 J | 4.3 J | 8.1 J | 17 J | 19 J | 34 J | 35 J |
| Copper | 8.1 | 27 J | 34 J | 13 J | 50 J | 84 J | 90 J | 74 J |
| Iron | 7200 B | 39000 J | 10000 J | 15000 J | 18000 J | 95000 J | 35000 J | 24000 J |
| Lead | 28 | 64 J | 120 J | 31 J | 280 J | 170 J | 330 J | 470 J |
| Magnesium | 1700 B | 1200 J | 1100 J | 1000 J | 2200 J | 3300 J | 3000 J | 4000 J |

Table 4.2-10
Summary of Detected Chemicals for Sediment Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SD-MMB-SW/SD-1-XXX MMB-SW/SD-1 2/17/2011 0-0.5 ft | OC-SD-MMB-SW/SD-2-XXX MMB-SW/SD-2 12/3/2010 0-0.5 ft | OC-SD-MMB-SW/SD-3-XXX MMB-SW/SD-3 12/3/2010 0-0.5 ft | OC-SD-MMB-SW/SD-4-XXX MMB-SW/SD-4 12/2/2010 0-0.5 ft | OC-SD-MMB-SW/SD-5-XXX MMB-SW/SD-5 12/2/2010 0-0.5 ft | OC-SD-MMB-SW/SD-6-XXX MMB-SW/SD-6 12/3/2010 0-0.5 ft | OC-SD-MMB-SW/SD-8A-XXX MMB-SW/SD-8A 12/2/2010 0-0.5 ft | OC-SD-MMB-SW/SD-8-XXX MMB-SW/SD-8 12/2/2010 0-0.5 ft |
|------------------------------------|---|---|---|---|---|---|---|---|
| Manganese | 110 B | 2100 J | 520 J | 650 J | 610 J | 1900 J | 690 J | 600 J |
| Mercury | 0.027 JB | 0.22 J | 0.38 J | 0.47 UJ | 0.26 J | 0.51 J | 0.45 J | 0.43 J |
| Nickel | 8.5 | 11 J | 12 J | 6.4 J | 22 J | 28 J | 44 J | 45 J |
| Potassium | 730 | 470 J | 770 J | 470 J | 1400 J | 1500 J | 1700 J | 2900 J |
| Selenium | 1.1 U | 3.6 UJ | 4.2 UJ | 3.4 UJ | 4.3 UJ | 2.4 UJ | 3.4 UJ | 1.2 J |
| Silver | 1.1 U | 3.6 UJ | 4.2 UJ | 3.4 UJ | 4.3 UJ | 0.74 J | 3.4 UJ | 2.9 UJ |
| Sodium | 180 J | 580 J | 720 J | 570 J | 940 J | 280 J | 800 J | 720 J |
| Thallium | 2.2 U | 1.4 J | 8.3 UJ | 6.7 UJ | 8.6 UJ | 4.7 UJ | 6.8 UJ | 5.7 UJ |
| Tin | 0.85 JB | 7.6 J | 16 J | 34 UJ | 7.1 J | 11 J | 7.7 J | 7.9 J |
| Vanadium | 12 | 21 J | 29 J | 18 J | 48 J | 50 J | 54 J | 61 J |
| Zinc | 36 | 160 J | 190 J | 59 J | 240 J | 500 J | 430 J | 460 J |
| Chloride | 210 | 630 | 1000 | 480 | 860 | 150 | 690 | 420 |
| Nitrogen, as Ammonia | 130 | 580 J | 960 J | 790 J | 880 J | 530 J | 620 J | 730 J |
| Sulfate | 75 U | 1200 J | 940 J | 350 J | 360 J | 690 J | 940 J | 550 J |
| Total Organic Carbon | 65000 | 260000 J | 290000 J | 310000 J | 220000 J | 140000 J | 180000 J | 150000 J |
| Specialty Compounds (mg/Kg) | | | | | | | | |
| Acetaldehyde | | 0.4 J | 0.27 J | 1.2 U | 0.22 J | 0.42 J | 0.23 J | 1 UJ |
| Formaldehyde | | 4 | 2.3 | 1.7 | 2.2 | 3.2 | 2.9 | 2 J |

Notes:

(1) Background location identified for the Maple Meadow Brook Wetland is located at SDBK-004.

mg/Kg = milligram per kilogram

U = not detected,

value is the reporting limit

J = value is estimated

R = value is rejected

B = compound was found in the blank and sample

* = LCS or LCSD exceeds the control limits

Table 4.2-10
Summary of Detected Chemicals for Sediment Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SD-MMB-SW/SD-9-XXX MMB-SW/SD-9 12/1/2010 0-0.5 ft | OC-SD-SDREF-012-XXX SDREF-012 12/3/2010 0-0.5 ft |
|--------------------------------------|---|---|
| Volatile Organics (mg/Kg) | | |
| 2-Butanone | 0.028 U | 0.12 |
| Acetone | 0.035 J | 0.41 J |
| Semivolatile Organics (mg/Kg) | | |
| 3 & 4 Methylphenol | 0.045 U | 0.067 U |
| 4-Nitrophenol | 0.22 U | 0.33 U |
| Anthracene | 0.045 U | 0.067 U |
| Benzaldehyde | 0.045 U | 0.056 J |
| Benzo(a)anthracene | 0.045 U | 0.082 |
| Benzo(a)pyrene | 0.045 U | 0.1 |
| Benzo(b)fluoranthene | 0.045 U | 0.15 |
| Benzo(ghi)perylene | 0.045 U | 0.092 |
| Benzo(k)fluoranthene | 0.045 U | 0.071 |
| Benzoic Acid | 0.21 J | 0.29 J |
| Benzyl alcohol | 0.089 U | 0.13 U |
| Bis(2-Ethylhexyl)phthalate | 0.23 | 0.083 |
| Caprolactam | 0.045 U | 0.067 U |
| Carbazole | 0.045 U | 0.025 J |
| Chrysene | 0.045 U | 0.13 |
| Dibenz(a,h)anthracene | 0.045 U | 0.041 J |
| Fluoranthene | 0.045 U | 0.24 |
| Indeno(1,2,3-cd)pyrene | 0.045 U | 0.1 |
| Naphthalene | 0.11 U | 0.16 U |
| Phenanthrene | 0.054 U | 0.13 |
| Pyrene | 0.045 U | 0.21 |
| Inorganics (mg/Kg) | | |
| Aluminum | 5400 | 7000 |
| Arsenic | 3.9 | 7.2 |
| Barium | 22 | 43 |
| Beryllium | 0.18 J | 0.25 J |
| Cadmium | 0.082 J | 0.45 J |
| Calcium | 930 | 2100 |
| Chromium | 7.5 J | 11 J |
| Cobalt | 2.5 | 3.8 |
| Copper | 7.4 | 18 |
| Iron | 6400 | 16000 |
| Lead | 7.2 | 35 |
| Magnesium | 1100 | 1200 |

Table 4.2-10
Summary of Detected Chemicals for Sediment Samples - Maple Meadow Brook Wetland
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Parameter | OC-SD-MMB-SW/SD-9-XXX MMB-SW/SD-9 12/1/2010 0-0.5 ft | OC-SD-SDREF-012-XXX SDREF-012 12/3/2010 0-0.5 ft |
|------------------------------------|---|---|
| Manganese | 110 | 560 |
| Mercury | 0.11 U | 0.13 U |
| Nickel | 5.4 J | 7.2 J |
| Potassium | 540 | 520 |
| Selenium | 0.75 U | 1.2 U |
| Silver | 0.75 U | 1.2 U |
| Sodium | 51 J | 69 J |
| Thallium | 1.5 U | 2.3 U |
| Tin | 7.5 U | 12 U |
| Vanadium | 8.9 | 13 |
| Zinc | 22 | 96 |
| Chloride | 34 | 110 |
| Nitrogen, as Ammonia | 62 J | 120 J |
| Sulfate | 120 J | 200 J |
| Total Organic Carbon | 13000 J | 88000 J |
| Specialty Compounds (mg/Kg) | | |
| Acetaldehyde | 0.27 UJ | |
| Formaldehyde | 0.31 J | |

Notes:

(1) Background location identified for the Maple Meadow Brook Wetland is located at SDBK-004.

mg/Kg = milligram per kilogram

U = not detected,
value is the reporting limit

J = value is estimated

R = value is rejected

B = compound was found in the blank
and sample

* = LCS or LCSD exceeds the control
limits

Prepared by / Date: KJC 03/28/13
Checked by / Date: CTM 03/28/13

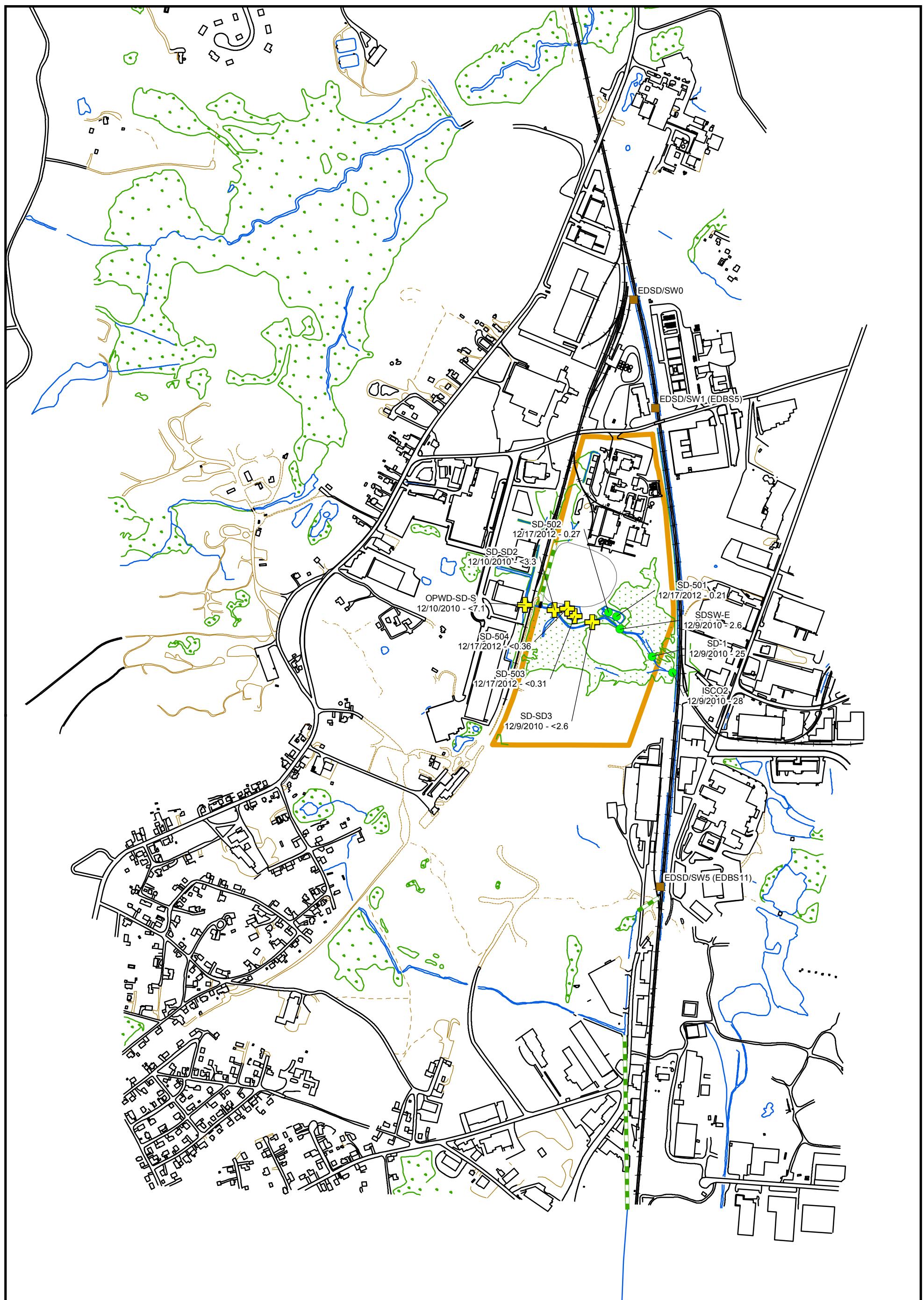
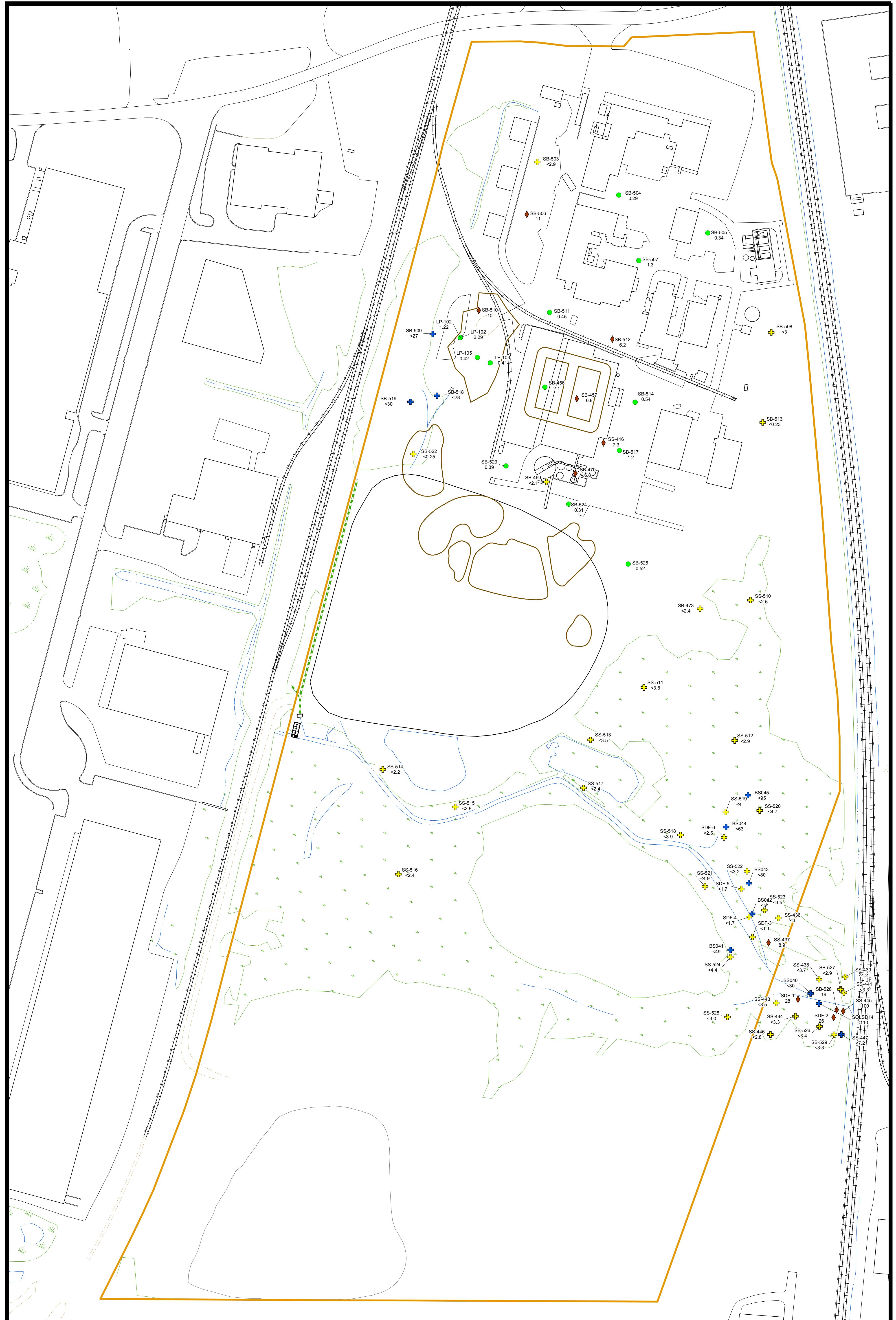


Figure 4.1-43
Distribution of Sediment Concentrations
for Hexavalent Chromium
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 03/11/14 Checked/Date: CTM 03/11/14

ATTACHMENT D
HEXAVALENT CHROMIUM IN SOIL

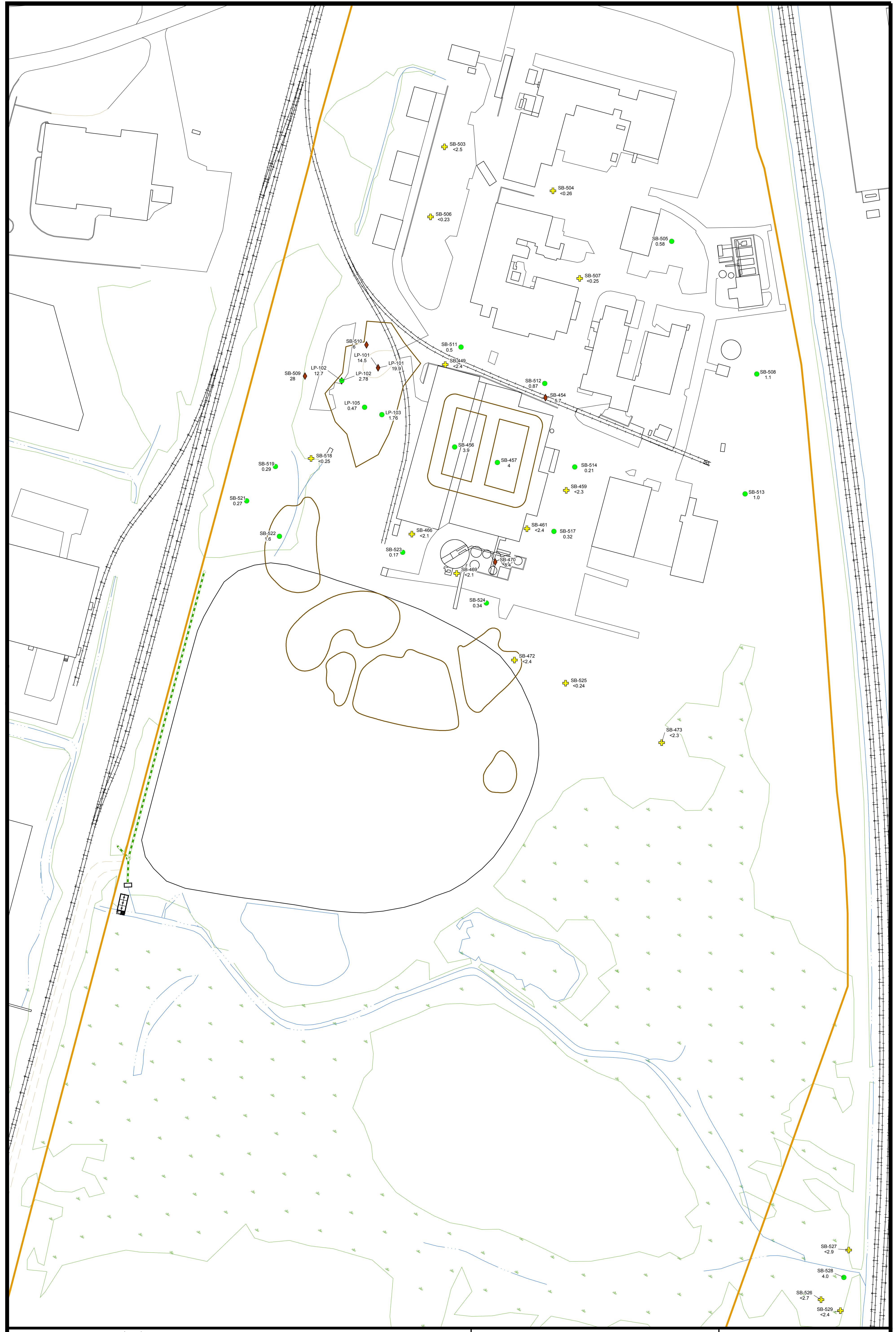
ATTACHMENT D-1
HEXAVALENT CHROMIUM IN SOIL FIGURES
FROM JULY 2015 OU1 AND OU2 REMEDIAL INVESTIGATION REPORT



AMEC Environment & Infrastructure
271 Mill Road
Chelmsford, MA 01824

Figure 4.1-8
Distribution of Surface Soil
Concentrations for Hexavalent Chromium
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 03/06/14 Checked/Date: CTM 03/06/14



amec

AMEC Environment & Infrastructure
2 Robbins Rd
Westford, MA 01886

Figure 4.1-9
Distribution of Soil (1 to 10 ft)
Concentrations for Hexavalent Chromium
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 04/16/13 | Checked/Date: CTM 04/16/13



Figure 4.1-10
Distribution of Soil (Greater Than 10 ft)
Concentrations for Hexavalent Chromium
Remedial Investigation Report - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 04/16/13 | Checked/Date: CTM 04/16/13

ATTACHMENT D-2

**COPY OF ATTACHMENT 7 TO THE 2015 BASELINE HUMAN HEALTH RISK
ASSESSMENT – CHROMIUM EVALUATION**

CHROMIUM EVALUATION

An evaluation of the relationship of hexavalent chromium (CrVI) to total chromium (total Cr) concentrations in soils at OU1 and OU2 was conducted to determine if a percentage of the total Cr data should be evaluated as CrVI in the HHRA. The majority of soil samples at the Site have been analyzed for total chromium.

Two statistical comparisons were performed, one of which utilized the comprehensive site-wide soil data set for both CrVI and total Cr, the second of which utilized the soil data subset which forms the basis of the HHRA and for which the same samples were analyzed for both CrVI and total Cr.

Site-Wide Data Set Analysis

As shown in Figure 1, a box plot was created using soil data analyzed for either total Cr or CrVI. A total of 968 soil samples (a combination of surface and subsurface) were analyzed for total Cr and a total of 142 soil samples (surface and subsurface) were analyzed for CrVI. Separate box plots were constructed for detected and non-detect CrVI samples. The reporting limit was used as the non-detect value. As shown on Figure 1, the statistics for the CrVI detects and non-detects are generally consistent (both approximate a median CrVI value of about 2 mg/kg). The total Cr median is 36 mg/kg. This results in a CrVI to total Cr ratio of approximately 7% (based on comparison of medians). The box plots also show that the spread of the total Cr is much greater than the spread of the Cr VI (the interquartile ranges (IQR) for total Cr and CrVI are very different) and hence use of a ratio derived from the overall data set to convert the higher detected values of total Cr would not be representative of actual CrVI concentrations at the Site.

Paired Total Cr and CrVI Data Set analysis

In the soil data selected for the HHRA51 soil samples were collected and analyzed for both total Cr and CrVI. These 51 soil samples include both surface and subsurface soils from OU1 and OU2. Total chromium was detected in all 51 soil samples, but CrVI was only detected in 23 of the 51 soil samples. Figure 2 shows the percentage of CrVI to total Cr in the 23 soil samples where both total Cr and CrVI were detected. CrVI accounts for four percent of the total chromium concentration in these soil samples, on average. Figure 3 present concentrations of total Cr and CrVI for all samples where both parameters were analyzed, including samples where CrVI was not detected.

Conclusions

In summary, CrVI is a relatively small percentage of the total Cr detected in soil at OU1 and OU2. CrVI is often non-detect in samples for which total Cr is relatively elevated or the ratio of CrVI/total Cr is often quite low for the higher detections of total Cr. Further, as indicated in the box plots, the spread of total Cr and CrVI are not consistent. These findings indicate a general lack of correlation between total Cr and CrVI concentrations in soil for OU1 and OU2. Surrogate CrVI concentrations derived for the higher detected total Cr concentrations, using the ratio

Olin Chemical Superfund Site – Wilmington, MA
Chromium Evaluation

derived herein, would result in surrogate CrVI concentrations that are not likely representative of actual CrVI concentrations at the Site. Therefore, we conclude that it would not be appropriate to convert total Cr data to CrVI concentrations in soil at OU1 and OU2 for purposes of the HHRA. Total chromium soil concentrations should be evaluated as trivalent chromium based on our analysis.

There are 114 soil samples, surface and subsurface, which have been analyzed for CrVI in the HHRA data set. This is considered an ample data set for evaluation of CrVI exposures in the HHRA. The distribution of hexavalent chromium concentrations in soil, surface and subsurface (1-10 ft), are shown in the RI Figures 4.1-8 and 4.1-9.

Figure 1
Total Chromium VS Hexavalent Chromium in Soil (All Soil Samples)
Olin Chemical Superfund Site
Wilmington, Massachusetts

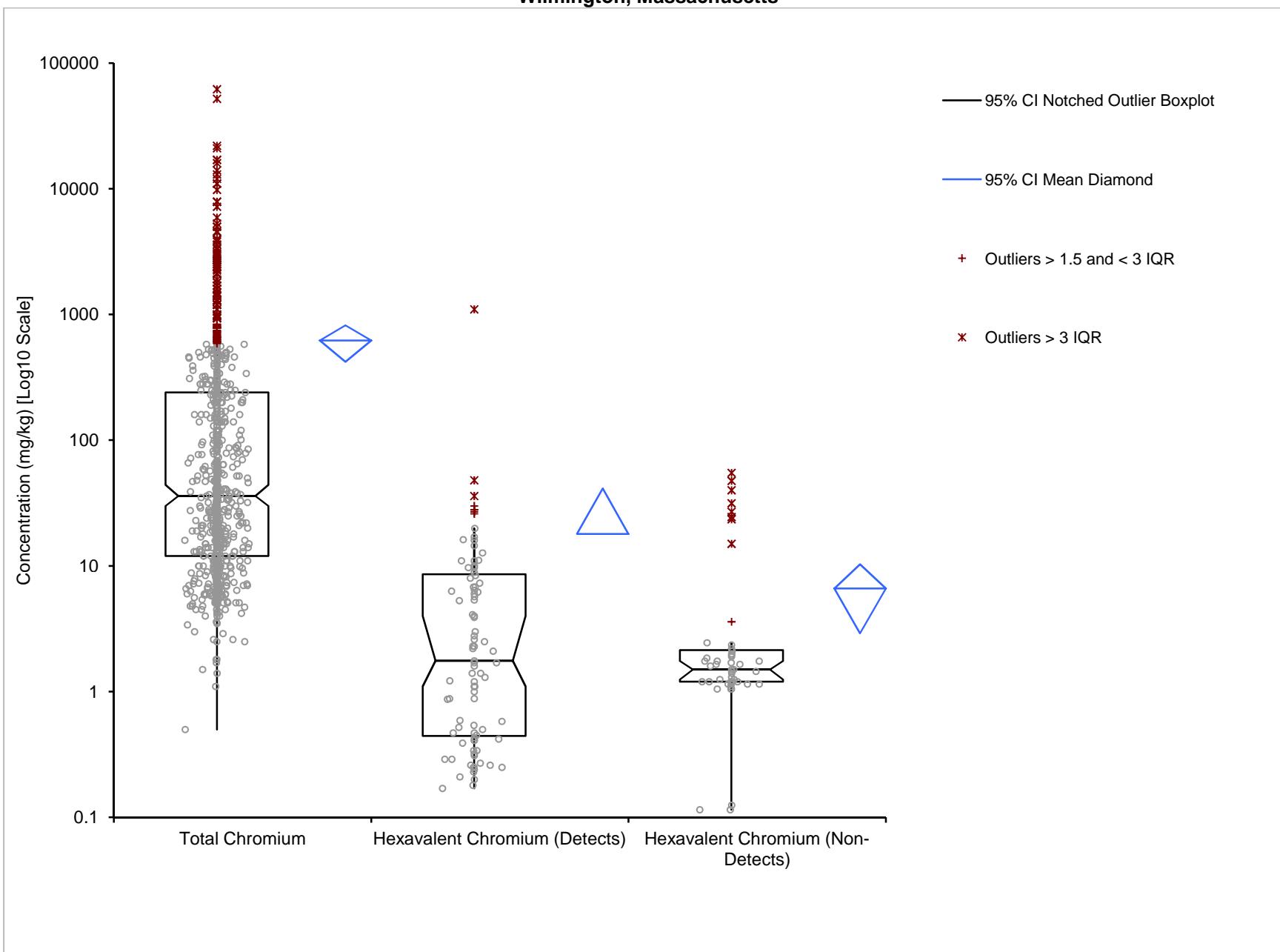


Figure 1
Total Chromium VS Hexavalent Chromium in Soil (All Soil Samples)
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Groups | n | Mean | 95% CI | SE | SD |
|-----------------------------------|-----|----------|----------------------|-----------|------------|
| Total Chromium | 968 | 619.3471 | 419.7981 to 818.8961 | 101.68517 | 3163.70010 |
| Hexavalent Chromium (Detects) | 93 | 17.9578 | -5.4779 to 41.3936 | 11.79995 | 113.79458 |
| Hexavalent Chromium (Non-Detects) | 49 | 6.6072 | 2.9122 to 10.3023 | 1.83775 | 12.86427 |

| Groups | n | Min | 1st Quartile | Median | 95% CI | 3rd Quartile | Max | IQR |
|-----------------------------------|-----|-------|--------------|---------|--------------------|--------------|-----------|----------|
| Total Chromium | 968 | 0.500 | 12.0000 | 36.0000 | 29.9000 to 44.0000 | 240.0000 | 62000.000 | 228.0000 |
| Hexavalent Chromium (Detects) | 93 | 0.170 | 0.4433 | 1.7600 | 1.1000 to 4.0000 | 8.5667 | 1100.000 | 8.1233 |
| Hexavalent Chromium (Non-Detects) | 49 | 0.115 | 1.2000 | 1.5000 | 1.2500 to 1.7500 | 2.1333 | 55.000 | 0.9333 |

Notes:

mg/kg - milligram per kilogram

n - number

CI - confidence interval

SE - standard error

SD - standard deviation

Min - minimum

Max - maximum

IQR - interquartile range

Prepared By: EYM 3/5/13

Checked By: MJM 3/5/13

Figure 2
Comparison of Hexavalent Chromium to Total Chromium in Soil Used in the HHRA
Olin Chemical Superfund Site
Wilmington, Massachusetts

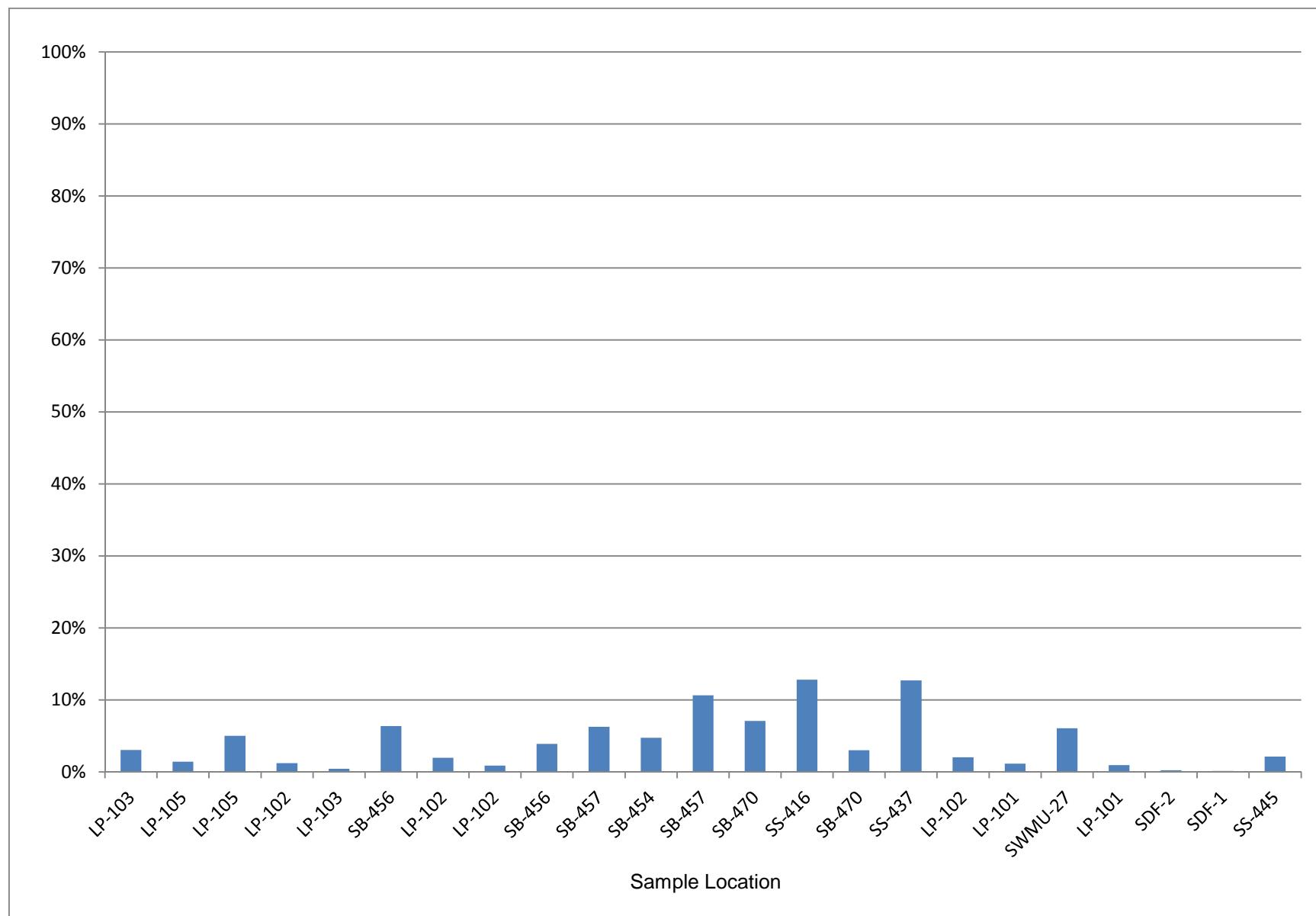


Figure 3
Comparison of Hexavalent Chromium to Total Chromium Concentrations in Soil Used in the HHRA
Olin Chemical Superfund Site
Wilmington, Massachusetts

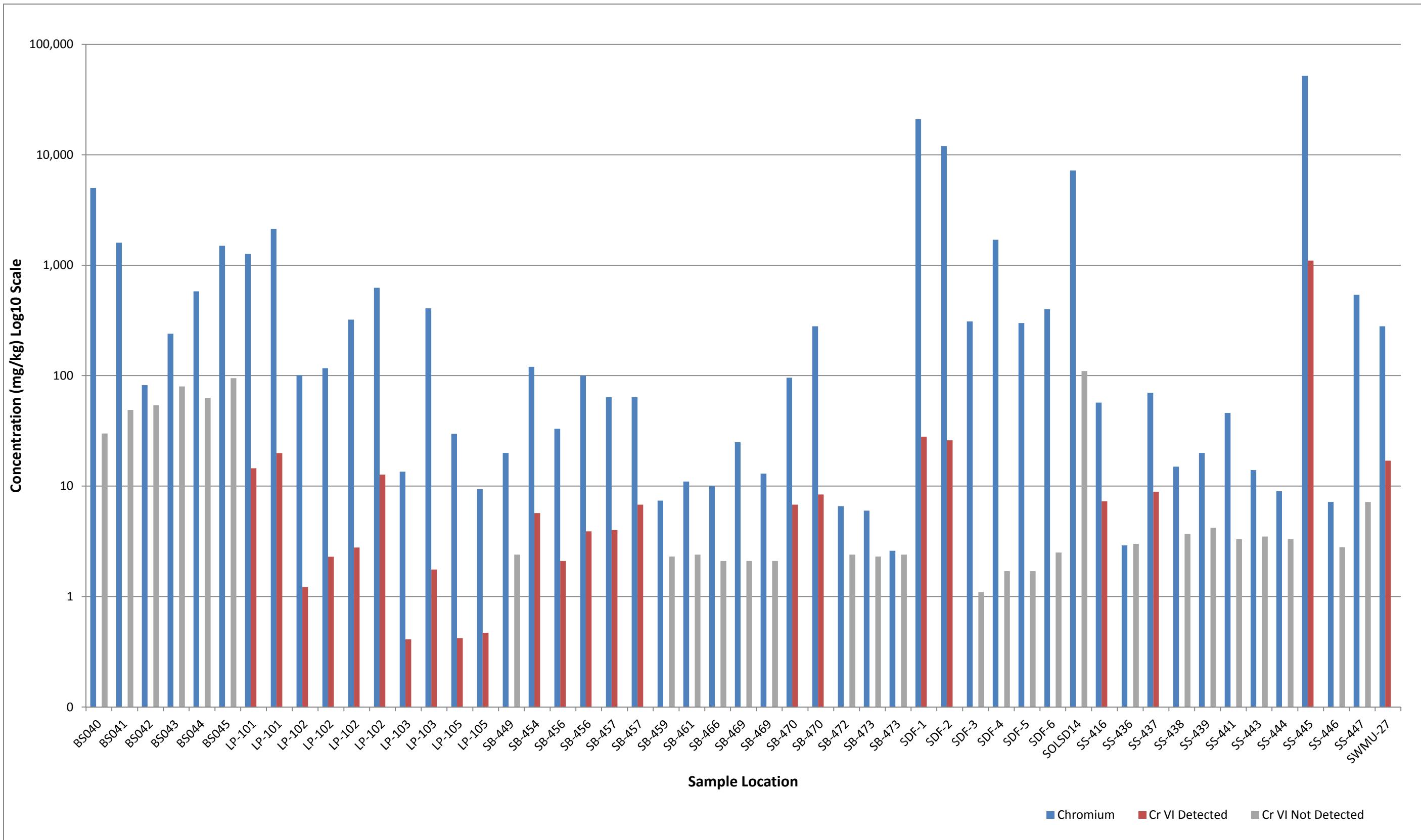


Table 1
Comparison of Total Chromium and Hexavalent Chromium Concentrations in Soil
Human Health Risk Assessment - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | Sample ID | Sample Date | Sample Type | Depth (ft) | Excavated | Area | Chromium (mg/kg) | Hexavalent Chromium (mg/kg) | Ratio Using Reporting Limit (1) | Ratio Using 1/2 Reporting Limit (1) | Ratio Using Detects (1) | Ratio Using On Property Detects - Field Samples (1) |
|----------|-----------------------|-------------|-------------|------------|-----------|--------------|------------------|-----------------------------|---------------------------------|-------------------------------------|-------------------------|---|
| BS040 | BS040LSD | 8/22/2005 | FS | 0-0.5 | No | EA5 | 5000 | 30 U | 0.6% | 0.3% | | |
| BS041 | BS041LSD-DUP | 8/22/2005 | FD | 0-0.5 | No | EA4 | 1700 | 47 U | 2.8% | 1.4% | | |
| BS041 | BS041LSD | 8/22/2005 | FS | 0-0.5 | No | EA4 | 1600 | 49 U | 3.1% | 1.5% | | |
| BS042 | BS042LSD | 8/22/2005 | FS | 0-0.5 | No | EA6 | 82 | 54 U | 65.9% | 32.9% | | |
| BS043 | BS043LSD | 8/22/2005 | FS | 0-0.5 | No | EA6 | 240 | 80 U | 33.3% | 16.7% | | |
| BS044 | BS044LSD | 8/23/2005 | FS | 0-0.5 | No | EA6 | 580 | 63 U | 10.9% | 5.4% | | |
| BS045 | BS045LSD | 8/23/2005 | FS | 0-0.5 | No | EA6 | 1500 | 95 U | 6.3% | 3.2% | | |
| LP-101 | SB101XXLPX | 11/24/1998 | FS | 6-8 | No | EA1 | 1270 | 14.5 | 1.1% | 1.1% | 1.1% | 1.1% |
| LP-101 | 101B | 11/30/1998 | FS | 6-8 | No | EA1 | 2130 | 19.9 | 0.9% | 0.9% | 0.9% | 0.9% |
| LP-101 | 101A | 11/30/1998 | FS | 0-2 | Yes | EA1 | 1440 | 11.1 | 0.8% | 0.8% | 0.8% | 0.8% |
| LP-102 | 102B | 11/30/1998 | FS | 6-8 | No | EA1 | 624 | 12.7 | 2.0% | 2.0% | 2.0% | 2.0% |
| LP-102 | 102A | 11/30/1998 | FS | 0-2 | No | EA1 | 117 | 2.29 | 2.0% | 2.0% | 2.0% | 2.0% |
| LP-102 | SS102XXLPX | 11/24/1998 | FS | 0-2 | No | EA1 | 101 | 1.22 | 1.2% | 1.2% | 1.2% | 1.2% |
| LP-102 | SS101XXLPX | 11/24/1998 | FS | 0-2 | Yes | EA1 | 41 | 0.43 | 1.0% | 1.0% | 1.0% | 1.0% |
| LP-102 | SB102XXLPX | 11/24/1998 | FS | 6-8 | No | EA1 | 322 | 2.78 | 0.9% | 0.9% | 0.9% | 0.9% |
| LP-103 | SS103XXLPX | 11/24/1998 | FS | 0-2 | No | EA1 | 13.5 | 0.41 | 3.0% | 3.0% | 3.0% | 3.0% |
| LP-103 | SS103XXLPD DUP | 11/24/1998 | FD | 0-2 | No | EA1 | 14.6 | 0.41 | 2.8% | 2.8% | 2.8% | |
| LP-103 | SB103XXLPX | 11/24/1998 | FS | 6-8 | No | EA1 | 407 | 1.76 | 0.4% | 0.4% | 0.4% | 0.4% |
| LP-104 | 104A | 11/30/1998 | FS | 0-2 | Yes | EA1 | 33.3 | 0.88 | 2.6% | 2.6% | 2.6% | 2.6% |
| LP-104 | SS104XXLPX | 11/24/1998 | FS | 0-2 | Yes | EA1 | 27.6 | 0.59 | 2.1% | 2.1% | 2.1% | 2.1% |
| LP-104 | 104B | 11/30/1998 | FS | 6-8 | Yes | EA1 | 524 | 5.36 | 1.0% | 1.0% | 1.0% | 1.0% |
| LP-104 | SB104XXLPX | 11/24/1998 | FS | 6-8 | Yes | EA1 | 2610 | 16.2 | 0.6% | 0.6% | 0.6% | 0.6% |
| LP-105 | SB105XXLPX | 11/24/1998 | FS | 6-8 | No | EA1 | 9.4 | 0.47 | 5.0% | 5.0% | 5.0% | 5.0% |
| LP-105 | SS105XXLPX | 11/24/1998 | FS | 0-2 | No | EA1 | 29.8 | 0.42 | 1.4% | 1.4% | 1.4% | 1.4% |
| NPSB1 | NPSB1-Fill1 | 11/20/2003 | FS | 0-2 | No | Off Property | 18.8 | 0.54 U | 2.9% | 1.4% | | |
| NPSB1 | NPSB1-SED1 | 11/20/2003 | FS | 6-7.5 | No | Off Property | 17.5 | 0.66 U | 3.8% | 1.9% | | |
| NPSB2 | NPSB2-Fill1 | 11/20/2003 | FS | 2-3 | No | Off Property | 50.6 | 0.57 U | 1.1% | 0.6% | | |
| NPSB3 | NPSB3-Fill1 | 11/20/2003 | FS | 2-4 | No | Off Property | 53.8 | 0.54 U | 1.0% | 0.5% | | |
| NPSB3 | NPSB3-SED1 | 11/20/2003 | FS | 9.4-10.4 | No | Off Property | 15.5 | 0.6 U | 3.9% | 1.9% | | |
| NPSB4 | NPSB4-Fill1 | 9/8/2004 | FS | 0-2 | No | Off Property | 50 | 5.6 U | 11.2% | 5.6% | | |
| NPSB4 | NPSB4-Sed | 9/8/2004 | FS | 5-7 | No | Off Property | 32 | 4.9 U | 15.3% | 7.7% | | |
| NPSB4 | NPSB4-Soil | 9/8/2004 | FS | 10-11.5 | No | Off Property | 29 | 4.9 U | 16.9% | 8.4% | | |
| RSD-10 | RSD-10 | 1/18/2000 | FS | | No | EA4 | 400 | 95 | 23.8% | 23.8% | 23.8% | 23.8% |
| SB-449 | OC-SB-449-6.0/8.0-XXX | 8/27/2009 | FS | 6-8 | No | EA1 | 20 | 2.4 U | 12.0% | 6.0% | | |
| SB-454 | OC-SB-454-6.0/8.0-XXX | 8/27/2009 | FS | 6-8 | No | EA1 | 120 | 5.7 | 4.8% | 4.8% | 4.8% | 4.8% |
| SB-454 | OC-SB-454-18/20-XXX | 8/27/2009 | FS | 18-20 | No | EA1 | 250 | 10 | 4.0% | 4.0% | 4.0% | 4.0% |
| SB-456 | OC-SB-456-0.1/0.1-XXX | 9/11/2009 | FS | 0-1 | No | EA1 | 33 | 2.1 | 6.4% | 6.4% | 6.4% | 6.4% |
| SB-456 | OC-SB-456-7.0/9.0-DUP | 9/11/2009 | FD | 7-9 | No | EA1 | 100 | 6.3 | 6.3% | 6.3% | 6.3% | |
| SB-456 | OC-SB-456-7.0/9.0-XXX | 9/11/2009 | FS | 7-9 | No | EA1 | 100 | 3.9 | 3.9% | 3.9% | 3.9% | 3.9% |
| SB-456 | OC-SB-456-16/18-XXX | 9/11/2009 | FS | 16-18 | No | EA1 | 280 | 9.7 | 3.5% | 3.5% | 3.5% | 3.5% |
| SB-457 | OC-SB-457-0.1/0.1-XXX | 9/11/2009 | FS | 0-1 | No | EA1 | 64 | 6.8 | 10.6% | 10.6% | 10.6% | 10.6% |
| SB-457 | OC-SB-457-8.0/10-XXX | 9/11/2009 | FS | 8-10 | No | EA1 | 64 | 4 | 6.3% | 6.3% | 6.3% | 6.3% |
| SB-457 | OC-SB-457-28/30-XXX | 9/14/2009 | FS | 28-30 | No | EA1 | 180 | 11 | 6.1% | 6.1% | 6.1% | 6.1% |
| SB-459 | OC-SB-459-6.0/8.0-DUP | 9/3/2009 | FD | 6-8 | No | EA1 | 7.4 | 2.3 U | 31.1% | 15.5% | | |
| SB-459 | OC-SB-459-6.0/8.0-XXX | 9/3/2009 | FS | 6-8 | No | EA1 | 7.4 | 2.3 U | 31.1% | 15.5% | | |
| SB-461 | OC-SB-461-5.0/7.0-XXX | 9/3/2009 | FS | 5-7 | No | EA1 | 11 | 2.4 U | 21.8% | 10.9% | | |
| SB-466 | OC-SB-466-30/32-XXX | 9/8/2009 | FS | 30-32 | No | EA1 | 250 | 16 | 6.4% | 6.4% | 6.4% | 6.4% |
| SB-466 | OC-SB-466-6.0/8.0-XXX | 9/8/2009 | FS | 6-8 | No | EA1 | 10 | 2.1 U | 21.0% | 10.5% | | |

Table 1
Comparison of Total Chromium and Hexavalent Chromium Concentrations in Soil
Human Health Risk Assessment - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | Sample ID | Sample Date | Sample Type | Depth (ft) | Excavated | Area | Chromium (mg/kg) | Hexavalent Chromium (mg/kg) | Ratio Using Reporting Limit (1) | Ratio Using 1/2 Reporting Limit (1) | Ratio Using Detects (1) | Ratio Using On Property Detects - Field Samples (1) |
|----------|-----------------------|-------------|-------------|------------|-----------|--------------|------------------|-----------------------------|---------------------------------|-------------------------------------|-------------------------|---|
| SB-469 | OC-SB-469-0.0/1.0-XXX | 9/8/2009 | FS | 0-1 | No | EA1 | 25 | 2.1 U | 8.4% | 4.2% | | |
| SB-469 | OC-SB-469-7.0/9.0-XXX | 9/9/2009 | FS | 7-9 | No | EA1 | 13 | 2.1 U | 16.2% | 8.1% | | |
| SB-470 | OC-SB-470-0.0/1.0-XXX | 9/4/2009 | FS | 0-1 | No | EA1 | 96 | 6.8 | 7.1% | 7.1% | 7.1% | 7.1% |
| SB-470 | OC-SB-470-31/33-XXX | 9/4/2009 | FS | 31-33 | No | EA1 | 50 | 2.6 | 5.2% | 5.2% | 5.2% | 5.2% |
| SB-470 | OC-SB-470-7.0/9.0-XXX | 9/4/2009 | FS | 7-9 | No | EA1 | 280 | 8.4 | 3.0% | 3.0% | 3.0% | 3.0% |
| SB-472 | OC-SB-472-30/32-XXX | 9/4/2009 | FS | 30-32 | No | EA1 | 280 | 5.3 | 1.9% | 1.9% | 1.9% | 1.9% |
| SB-472 | OC-SB-472-8.0/10-XXX | 9/4/2009 | FS | 8-10 | No | EA1 | 6.6 | 2.4 U | 36.4% | 18.2% | | |
| SB-473 | OC-SB-473-0.0/1.0-XXX | 9/18/2009 | FS | 0-1 | No | EA6 | 2.6 | 2.4 U | 92.3% | 46.2% | | |
| SB-473 | OC-SB-473-4.0/6.0-XXX | 9/18/2009 | FS | 4-6 | No | EA6 | 6 | 2.3 U | 38.3% | 19.2% | | |
| SB-600 | OC-SB-600-6.0/8.0-XXX | 3/6/2013 | FS | 6-8 | No | Off Property | 20 | 0.3 | 1.5% | 1.5% | 1.5% | |
| SB-601 | OC-SB-601-6.0/8.0-XXX | 3/6/2013 | FS | 6-8 | No | Off Property | 37 | 0.25 U | 0.7% | 0.3% | | |
| SB-602 | OC-SB-602-7.0/9.0-XXX | 3/7/2013 | FS | 7-9 | No | Off Property | 65 | 0.39 U | 0.6% | 0.3% | | |
| SB-603 | OC-SB-603-7.0/9.0-XXX | 3/7/2013 | FS | 7-9 | No | Off Property | 6.4 | 0.26 U | 4.1% | 2.0% | | |
| SB-604 | DUP-5 | 3/7/2013 | FD | 9-11 | No | Off Property | 8 | 0.7 | 8.8% | 8.8% | 8.8% | |
| SB-604 | OC-SB-604-9.0/11-XXX | 3/7/2013 | FS | 9-11 | No | Off Property | 8.9 | 0.41 | 4.6% | 4.6% | 4.6% | |
| SB-605 | OC-SB-605-7.0/9.0-XXX | 3/8/2013 | FS | 7-9 | No | Off Property | 80 | 1.2 | 1.5% | 1.5% | 1.5% | |
| SDF-1 | 1010-SED-SDF-1S | 9/17/2001 | FS | 0-0.5 | No | EA5 | 21000 | 28 | 0.1% | 0.1% | 0.1% | 0.1% |
| SDF-2 | 1010-SED-SDF-2S | 9/17/2001 | FS | 0-0.5 | No | EA5 | 12000 | 26 | 0.2% | 0.2% | 0.2% | 0.2% |
| SDF-3 | 1010-SED-DUPE1 | 9/17/2001 | FD | 0-0.5 | No | EA6 | 820 | 1.4 U | 0.2% | 0.1% | | |
| SDF-3 | 1010-SED-SDF-3S | 9/17/2001 | FS | 0-0.5 | No | EA6 | 310 | 1.1 U | 0.4% | 0.2% | | |
| SDF-4 | 1010-SED-SDF-4S | 9/17/2001 | FS | 0-0.5 | No | EA6 | 1700 | 1.7 U | 0.1% | 0.1% | | |
| SDF-5 | 1010-SED-SDF-5S | 9/17/2001 | FS | 0-0.5 | No | EA6 | 300 | 1.7 U | 0.6% | 0.3% | | |
| SDF-6 | 1010-SED-SDF-6S | 9/17/2001 | FS | 0-0.5 | No | EA6 | 400 | 2.5 U | 0.6% | 0.3% | | |
| SOLSD14 | SOLSD-14-0-6 | 9/21/2005 | FS | 0-0.5 | No | EA5 | 7200 | 110 U | 1.5% | 0.8% | | |
| SS-416 | OC-SS-416-0.0/1.0-XXX | 9/15/2009 | FS | 0-1 | No | EA1 | 57 | 7.3 | 12.8% | 12.8% | 12.8% | 12.8% |
| SS-416 | OC-SS-416-0.0/1.0-DUP | 9/15/2009 | FD | 0-1 | No | EA1 | 56 | 6.4 | 11.4% | 11.4% | 11.4% | |
| SS-436 | OC-SS-436-0.0/1.0-XXX | 9/16/2009 | FS | 0-1 | No | EA6 | 2.9 | 3 U | 103.4% | 51.7% | | |
| SS-437 | OC-SS-437-0.0/1.0-XXX | 9/16/2009 | FS | 0-1 | No | EA6 | 70 | 8.9 | 12.7% | 12.7% | 12.7% | 12.7% |
| SS-438 | OC-SS-438-0.0/1.0-XXX | 6/3/2010 | FS | 0-1 | No | EA5 | 15 | 3.7 U | 24.7% | 12.3% | | |
| SS-439 | OC-SS-439-0.0/1.0-XXX | 6/3/2010 | FS | 0-1 | No | EA5 | 20 | 4.2 U | 21.0% | 10.5% | | |
| SS-441 | OC-SS-441-0.0/1.0-XXX | 6/3/2010 | FS | 0-1 | No | EA5 | 46 | 3.3 U | 7.2% | 3.6% | | |
| SS-443 | OC-SS-443-0.0/1.0-XXX | 6/3/2010 | FS | 0-1 | No | EA5 | 14 | 3.5 U | 25.0% | 12.5% | | |
| SS-444 | OC-SS-444-0.0/1.0-XXX | 6/3/2010 | FS | 0-1 | No | EA5 | 9 | 3.3 U | 36.7% | 18.3% | | |
| SS-445 | OC-SS-445-0.0/1.0-XXX | 6/3/2010 | FS | 0-1 | No | EA5 | 52000 | 1100 | 2.1% | 2.1% | 2.1% | 2.1% |
| SS-446 | OC-SS-446-0.0/1.0-XXX | 6/3/2010 | FS | 0-1 | No | EA5 | 7.2 | 2.8 U | 38.9% | 19.4% | | |
| SS-447 | OC-SS-447-0.0/1.0-XXX | 6/3/2010 | FS | 0-1 | No | EA5 | 540 | 7.2 U | 1.3% | 0.7% | | |
| SWMU-27 | SWMU-27 | 4/22/1993 | FS | 0-0 | Yes | EA2 | 280 | 17 | 6.1% | 6.1% | 6.1% | 6.1% |

| | | | | |
|--------------|--------|-------|-------|-------|
| Average: | 11.11% | 6.67% | 4.42% | 4.25% |
| 95% UCL (2): | 20.90% | 8.38% | 5.78% | 5.82% |

1 - Ratios are hexavalent chromium divided by chromium.

2 - 95% Upper Confidence Limits calculated using ProUCL 5.0.00

FS - Field Sample

FD - Field Duplicate

U - Not Detected, Value is Reporting Limit

Prepared by: LCG
Checked by: BJR

Table 2
Comparison of Total Chromium and Hexavalent Chromium in Surface Water
Human Health Risk Assessment - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | Sample ID | Sample Date | Sample Type | Area | fraction | Chromium (mg/L) | Hexavalent Chromium (mg/L) | Ratio Using Reporting Limit (1) | Ratio Using 1/2 Reporting Limit (1) | Ratio Using Detects (1) | Ratio Selected Detects (1) |
|-------------------|-----------------------------|-------------|-------------|-------------------------|----------|-----------------|----------------------------|---------------------------------|-------------------------------------|-------------------------|----------------------------|
| BACKFLOC | BACKFLOC-2003 | 6/19/2003 | FS | East Ditch | T | 0.161 | 0.005 U | 3.11% | 1.55% | | |
| BACKFLOC | BACKFLOCSW-2003 | 6/19/2003 | FS | East Ditch | D | 0.01 U | 0.005 U | | | | |
| EDLBSW1 | EDLBSW1-01 | 10/5/2004 | FS | East Ditch | T | 0.011 | 0.005 U | 45.45% | 22.73% | | |
| EDLBSW1 | EDLBSW1-02 | 2/15/2005 | FS | East Ditch | T | 0.005 U | 0.005 U | | | | |
| EDSD/SW0 | EDSW0-01 | 4/29/2004 | FS | East Ditch | T | 0.005 U | 0.005 U | | | | |
| EDSD/SW1 (EDBS5) | EDSW1-01 | 6/19/2003 | FS | East Ditch | T | 0.005 U | 0.005 U | | | | |
| EDSD/SW1 (EDBS5) | EDSW1-02 | 9/23/2003 | FS | East Ditch | T | 0.015 | 0.005 U | 33.33% | 16.67% | | |
| EDSD/SW1 (EDBS5) | EDSW1-03 | 4/29/2004 | FS | East Ditch | T | 0.005 U | 0.005 U | | | | |
| EDSD/SW2 (EDBS6) | EDSW2-01 | 6/19/2003 | FS | East Ditch | T | 0.005 U | 0.005 U | | | | |
| EDSD/SW2 (EDBS6) | EDSW2-02 | 9/23/2003 | FS | East Ditch | T | 0.075 | 0.005 U | 6.67% | 3.33% | | |
| EDSD/SW2 (EDBS6) | EDSW2-03 | 4/29/2004 | FS | East Ditch | T | 0.005 U | 0.005 U | | | | |
| EDSD/SW2 (EDBS6) | OC-SW-EDSD/SW2 (EDBS6)-XXX | 12/13/2010 | FS | East Ditch | T | 0.005 U | 0.001 U | | | | |
| EDSD/SW2 (EDBS6) | OC-SW-EDSD/SW2(EDBS6)-XXX | 6/8/2011 | FS | East Ditch | T | 0.005 U | 0.00056 | | | | |
| EDSD/SW3 (EDBS8) | EDSW3-01 | 6/19/2003 | FS | East Ditch | T | 0.12 | 0.005 U | 4.17% | 2.08% | | |
| EDSD/SW3 (EDBS8) | EDSW3-02 | 9/23/2003 | FS | East Ditch | T | 0.005 U | 0.005 U | | | | |
| EDSD/SW3 (EDBS8) | EDSW3-03 | 4/29/2004 | FS | East Ditch | T | 0.046 | 0.005 U | 10.87% | 5.43% | | |
| EDSD/SW4 (EDBS10) | EDSW4-01 | 6/19/2003 | FS | East Ditch | T | 0.009 | 0.005 U | 55.56% | 27.78% | | |
| EDSD/SW4 (EDBS10) | EDSW4-02 | 9/23/2003 | FS | East Ditch | T | 0.006 | 0.005 U | 83.33% | 41.67% | | |
| EDSD/SW4 (EDBS10) | EDSW4-03 | 4/29/2004 | FS | East Ditch | T | 0.033 | 0.005 U | 15.15% | 7.58% | | |
| EDSD/SW5 (EDBS11) | EDSW5-01 | 6/19/2003 | FS | East Ditch | T | 0.017 | 0.005 U | 29.41% | 14.71% | | |
| EDSD/SW5 (EDBS11) | EDSW5-02 | 9/23/2003 | FS | East Ditch | T | 0.031 | 0.005 U | 16.13% | 8.06% | | |
| EDSD/SW5 (EDBS11) | EDSW5-03 | 4/28/2004 | FS | East Ditch | T | 0.033 | 0.005 U | 15.15% | 7.58% | | |
| EDSD/SW5 (EDBS11) | OC-SW-EDSD/SW5 (EDBS11)-XXX | 12/13/2010 | FS | East Ditch | T | 0.065 | 0.00086 | 1.32% | 1.32% | 1.32% | 1.32% |
| EDSD/SW5 (EDBS11) | OC-SW-EDSD/SW5(EDBS11)-XXX | 6/8/2011 | FS | East Ditch | T | 0.004 | 0.001 U | 125.00% | 62.50% | | |
| EDSD/SW6 | EDSW6-01 | 6/18/2003 | FS | East Ditch | T | 0.007 | 0.005 U | 71.43% | 35.71% | | |
| EDSD/SW6 | EDSW6-02 | 9/23/2003 | FS | East Ditch | T | 0.031 | 0.005 U | 16.13% | 8.06% | | |
| EDSD/SW6 | EDSW6-03 | 4/28/2004 | FS | East Ditch | T | 0.02 | 0.005 U | 25.00% | 12.50% | | |
| EDSD/SW7 | EDSW7-01 | 4/28/2004 | FS | East Ditch | T | 0.011 | 0.005 U | 45.45% | 22.73% | | |
| EDSD/SW7 | EDSW7-02 | 10/5/2004 | FS | East Ditch | T | 0.005 U | 0.005 U | | | | |
| EDSD/SW7 | EDSW7-03 | 2/15/2005 | FS | East Ditch | T | 0.023 | 0.005 U | 21.74% | 10.87% | | |
| EDSD/SW8 | EDSW8-01 | 4/28/2004 | FS | East Ditch | T | 0.0094 | 0.005 U | 53.19% | 26.60% | | |
| EDSD/SW8 | EDSW8-02 | 10/5/2004 | FS | East Ditch | T | 0.057 | 0.005 U | 8.77% | 4.39% | | |
| EDSD/SW8 | EDSW8-03 | 2/15/2005 | FS | East Ditch | T | 0.021 | 0.005 U | 23.81% | 11.90% | | |
| GSW-1 | SOUTH DITCH #1 | 4/18/1996 | FS | South Ditch | D | 0.015 U | 0.01 U | | | | |
| GSW-11 | SW-11 | 2/2/1995 | FS | Off-Property West Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-11 | SW-11 | 2/2/1995 | FS | Off-Property West Ditch | T | 0.015 U | 0.015 U | | | | |
| GSW-11 | SW-11 | 5/3/1995 | FS | Off-Property West Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-11 | SW-11 | 5/3/1995 | FS | Off-Property West Ditch | T | 0.015 U | 0.015 U | | | | |
| GSW-11 | SW-17 | 10/18/1995 | FS | Off-Property West Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-11 | SW-17 | 10/18/1995 | FS | Off-Property West Ditch | T | 0.016 | 0.015 U | 93.75% | 46.88% | | |
| GSW-12 | SW-12 | 2/2/1995 | FS | Off-Property West Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-12 | SW-12 | 2/2/1995 | FS | Off-Property West Ditch | T | 0.015 U | 0.015 U | | | | |
| GSW-12 | SW-12 | 5/3/1995 | FS | Off-Property West Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-12 | SW-12 | 5/3/1995 | FS | Off-Property West Ditch | T | 0.015 U | 0.015 U | | | | |
| GSW-12 | SW-12 | 7/19/1995 | FS | Off-Property West Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-12 | SW-12 | 7/19/1995 | FS | Off-Property West Ditch | T | 0.015 U | 0.015 U | | | | |
| GSW-12 | SW-12 | 10/18/1995 | FS | Off-Property West Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-12 | SW-12 | 10/18/1995 | FS | Off-Property West Ditch | T | 0.015 U | 0.015 U | | | | |
| GSW-14 | SW-14 | 2/2/1995 | FS | Off-Property West Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-14 | SW-14 | 2/2/1995 | FS | Off-Property West Ditch | T | 0.015 U | 0.015 U | | | | |

Table 2
Comparison of Total Chromium and Hexavalent Chromium in Surface Water
Human Health Risk Assessment - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | Sample ID | Sample Date | Sample Type | Area | fraction | Chromium (mg/L) | Hexavalent Chromium (mg/L) | Ratio Using Reporting Limit (1) | Ratio Using 1/2 Reporting Limit (1) | Ratio Using Detects (1) | Ratio Selected Detects (1) |
|-----------|---------------------------|-------------|-------------|-------------------------|----------|-----------------|----------------------------|---------------------------------|-------------------------------------|-------------------------|----------------------------|
| GSW-14 | SW-14 | 5/3/1995 | FS | Off-Property West Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-14 | SW-14 | 5/3/1995 | FS | Off-Property West Ditch | T | 0.015 U | 0.015 U | | | | |
| GSW-14 | SW-14 | 7/19/1995 | FS | Off-Property West Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-14 | SW-14 | 7/19/1995 | FS | Off-Property West Ditch | T | 0.015 U | 0.015 U | | | | |
| GSW-14 | SW-14 | 10/18/1995 | FS | Off-Property West Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-14 | SW-14 | 10/18/1995 | FS | Off-Property West Ditch | T | 0.015 U | 0.015 U | | | | |
| GSW-15 | SW-15 | 2/2/1995 | FS | South Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-15 | SW-15 | 2/2/1995 | FS | South Ditch | T | 0.015 U | 0.015 U | | | | |
| GSW-15 | SW-15 | 5/3/1995 | FS | South Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-15 | SW-15 | 5/3/1995 | FS | South Ditch | T | 0.023 | 0.015 U | 65.22% | 32.61% | | |
| GSW-16 | SW-16 | 2/2/1995 | FS | Central Pond | D | 0.035 | 0.015 U | 42.86% | 21.43% | | |
| GSW-16 | SW-16 | 2/2/1995 | FS | Central Pond | T | 0.042 | 0.015 U | 35.71% | 17.86% | | |
| GSW-16 | SW-16 | 5/3/1995 | FS | Central Pond | D | 0.015 U | 0.015 U | | | | |
| GSW-16 | SW-16 | 5/3/1995 | FS | Central Pond | T | 0.015 U | 0.015 U | | | | |
| GSW-16 | SW-16 | 7/19/1995 | FS | Central Pond | D | 0.015 U | 0.015 U | | | | |
| GSW-16 | SW-16 | 7/19/1995 | FS | Central Pond | T | 0.015 U | 0.015 U | | | | |
| GSW-16 | SW-16 | 10/18/1995 | FS | Central Pond | D | 0.015 U | 0.015 U | | | | |
| GSW-16 | SW-16 | 10/18/1995 | FS | Central Pond | T | 0.015 U | 0.015 U | | | | |
| GSW-17 | SW-17 | 2/2/1995 | FS | South Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-17 | SW-17 | 2/2/1995 | FS | South Ditch | T | 0.015 U | 0.015 U | | | | |
| GSW-17 | SW-17 | 5/3/1995 | FS | South Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-17 | SW-17 | 5/3/1995 | FS | South Ditch | T | 0.015 U | 0.015 U | | | | |
| GSW-17 | SW-17 | 7/19/1995 | FS | South Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-17 | SW-17 | 7/19/1995 | FS | South Ditch | T | 0.015 U | 0.015 U | | | | |
| GSW-18 | SW-18 | 5/4/1995 | FS | Ephemeral Ditch | D | 0.015 U | 0.015 U | | | | |
| GSW-18 | SW-18 | 5/4/1995 | FS | Ephemeral Ditch | T | 0.015 U | 0.015 U | | | | |
| ISCO1 | OC-SW-ISCO-1-XXX | 6/6/2011 | FS | South Ditch | T | 0.012 | 0.001 U | 8.33% | 4.17% | | |
| ISCO2 | OC-SW-ISCO-2-XXX | 6/6/2011 | FS | South Ditch | T | 1.1 | 0.001 U | 0.09% | 0.05% | | |
| NP-1 | NP-1C | 7/20/2000 | FS | South Ditch | T | 0.015 | 0.005 U | 33.33% | 16.67% | | |
| NP-2 | NP-2C | 7/20/2000 | FS | South Ditch | T | 0.037 | 0.005 U | 13.51% | 6.76% | | |
| NP-2 | NP-2T | 7/20/2000 | FS | South Ditch | T | 8.5 | 0.005 U | 0.06% | 0.03% | | |
| NP-3 | NP-3C | 7/20/2000 | FS | On-Property West Ditch | T | 0.01 U | 0.005 U | | | | |
| NP-3 | NP-3T | 7/20/2000 | FS | On-Property West Ditch | T | 0.1 | 0.005 U | 5.00% | 2.50% | | |
| OPWD-SW-S | OC-SW-OPWD-SD/SO/SW-S-XXX | 12/10/2010 | FS | Off-Property West Ditch | T | 0.037 | 0.001 U | 13.51% | 6.76% | | |
| OPWD-SW-S | OC-SW-OPWD-SD/SO/SW-S-XXX | 6/7/2011 | FS | Off-Property West Ditch | T | 0.012 | 0.001 U | 41.67% | 20.83% | | |
| PZ-17RR | OC-SW-PZ-17RR-XXX | 12/17/2012 | FS | South Ditch | T | 0.71 | 0.005 U | 0.70% | 0.35% | | |
| REDFLOC | REDFLOC-2003 | 6/25/2003 | FS | Off-Property West Ditch | T | 168 | 0.005 U | 0.00% | 0.00% | | |
| REDFLOC | REDFLOCSW-2003 | 6/25/2003 | FS | Off-Property West Ditch | D | 0.068 | 0.005 U | 7.35% | 3.68% | | |
| SD-1 | OC-SW-SD-1-XXX | 12/17/2012 | FS | South Ditch | T | 0.29 | 0.005 U | 1.72% | 0.86% | | |
| SD-501 | OC-SW-SD-501-XXX | 12/17/2012 | FS | Central Pond | T | 0.0085 | 0.005 U | 58.82% | 29.41% | | |
| SD-503 | OC-SW-SD-503-XXX | 12/17/2012 | FS | Detention Pond | T | 0.0068 | 0.01 | 147.06% | 147.06% | 147.06% | |
| SOEAST | SOEASTSW-2003 | 6/25/2003 | FS | East Ditch | D | 0.01 U | 0.005 U | | | | |
| SW-13 | SW-13 | 12/1/1992 | FS | On-Property West Ditch | T | 0.015 U | 0.015 U | | | | |
| SW-16 | SW-16 | 12/2/1992 | FS | Off-Property West Ditch | T | 9.9 | 0.2 | 2.02% | 2.02% | 2.02% | 2.02% |
| SW-17 | SW-17 | 9/1/1992 | FS | Off-Property West Ditch | T | 11 | 0.25 | 2.27% | 2.27% | 2.27% | 2.27% |
| SW-17 | SW-17 | 12/2/1992 | FS | Off-Property West Ditch | T | 2.8 | 0.051 | 1.82% | 1.82% | 1.82% | 1.82% |
| SW-23 | SW-23 | 12/2/1992 | FS | East Ditch | T | 0.4 | 0.024 | 6.00% | 6.00% | 6.00% | 6.00% |
| SW-24 | SW-24 | 1/7/1993 | FS | East Ditch | T | 0.41 | 0.015 U | 3.66% | 1.83% | | |
| SW-25 | SW-25 | 3/25/1993 | FS | East Ditch | T | 0.17 | 0.015 U | 8.82% | 4.41% | | |
| SW-26 | SW-26 | 3/25/1993 | FS | East Ditch | T | 0.27 | 0.015 U | 5.56% | 2.78% | | |

Table 2
Comparison of Total Chromium and Hexavalent Chromium in Surface Water
Human Health Risk Assessment - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | Sample ID | Sample Date | Sample Type | Area | fraction | Chromium (mg/L) | Hexavalent Chromium (mg/L) | Ratio Using Reporting Limit (1) | Ratio Using 1/2 Reporting Limit (1) | Ratio Using Detects (1) | Ratio Selected Detects (1) |
|------------|------------------|-------------|-------------|--------------|----------|-----------------|----------------------------|---------------------------------|-------------------------------------|-------------------------|----------------------------|
| SW-27 | SW-27 | 3/25/1993 | FS | East Ditch | T | 0.22 | 0.015 U | 6.82% | 3.41% | | |
| SW-28 | SW-28 | 3/25/1993 | FS | East Ditch | T | 0.022 | 0.015 U | 68.18% | 34.09% | | |
| SW-29 | SW-29 | 3/25/1993 | FS | East Ditch | T | 0.015 U | 0.015 U | | | | |
| SW-30 | SW-30 | 4/20/1993 | FS | East Ditch | T | 0.015 U | 0.015 U | | | | |
| SW-6 | SW-06 | 12/1/1992 | FS | South Ditch | T | 0.39 | 0.028 | 7.18% | 7.18% | 7.18% | 7.18% |
| SW-8 | SW-08 | 12/1/1992 | FS | Central Pond | T | 0.057 | 0.074 | 129.82% | 129.82% | 129.82% | |
| WHITE FLOC | Whitefloc-2003 | 9/8/2003 | FS | South Ditch | T | 128 | 0.005 U | 0.004% | 0.002% | | |
| WHITE FLOC | WhiteflocSW-2003 | 9/8/2003 | FS | South Ditch | D | 0.01 U | 0.005 U | | | | |

1 - Ratios are hexavalent chromium divided by chromium.

2 - 95% Upper Confidence Limits calculated using ProUCL 5.0.00

FS - Field Sample

U - Not Detected, Value is Reporting Limit

| | | | | |
|--------------|--------|--------|---------|-------|
| Average: | 29.25% | 17.49% | 37.19% | 3.44% |
| 95% UCL (2): | 41.40% | 25.00% | 870.00% | 5.49% |

Prepared by: LCG
Checked by: BJR

Table 3
Comparison of Total Chromium and Hexavalent Chromium Concentration in Sediment
Human Health Risk Assessment - OU1 and OU2
Olin Chemical Superfund Site
Wilmington, Massachusetts

| Location | Sample ID | Sample Date | Sample Type | Excavated | Area | Chromium (mg/kg) | Hexavalent Chromium (mg/kg) | Ratio Using Reporting Limit (1) | Ratio Using 1/2 Reporting Limit (1) | Ratio Using Detects (1) |
|-------------------|---------------------------|-------------|-------------|-----------|-------------------------|------------------|-----------------------------|---------------------------------|-------------------------------------|-------------------------|
| BS030 | BS030LSD-02 | 22-Aug-05 | FS | No | Lower South Ditch | 2800 | 8 | 0.29% | 0.29% | 0.29% |
| BS031 | BS031LSD-02 | 22-Aug-05 | FS | No | Lower South Ditch | 570 | 7.9 | 1.39% | 1.39% | 1.39% |
| BS032 | BS032LSD-02 | 22-Aug-05 | FS | No | Lower South Ditch | 860 | 6.9 U | 0.80% | 0.40% | |
| EDSD/SW0 | EDSD0-01 | 29-Apr-04 | FS | No | East Ditch | 10 | 2.8 U | 28.00% | 14.00% | |
| EDSD/SW1 (EDBS5) | EDSD1-01 | 19-Jun-03 | FS | No | East Ditch | 16.1 | 4.7 U | 29.19% | 14.60% | |
| EDSD/SW2 (EDBS6) | EDSD2-01 | 6/19/2003 | FS | No | East Ditch | 17.3 | 4.4 U | 25.43% | 12.72% | |
| EDSD/SW3 (EDBS8) | EDSD3-01 | 6/19/2003 | FS | No | East Ditch | 239 | 2.6 U | 1.09% | 0.54% | |
| EDSD/SW4 (EDBS10) | EDSD4-01 | 6/19/2003 | FS | No | East Ditch | 2840 | 4.4 U | 0.15% | 0.08% | |
| EDSD/SW5 (EDBS11) | EDSD5-01 | 6/19/2003 | FS | No | East Ditch | 3120 | 4.1 U | 0.13% | 0.07% | |
| EDSD/SW6 | EDSD6-01 | 6/18/2003 | FS | No | East Ditch | 91.6 | 6.7 U | 7.31% | 3.66% | |
| EDSD/SW7 | EDSD7-01 | 4/28/2004 | FS | No | East Ditch | 150 | 3.2 U | 2.13% | 1.07% | |
| EDSD/SW8 | EDSD8-01 | 4/28/2004 | FS | No | East Ditch | 74 | 1.2 U | 1.62% | 0.81% | |
| ISCO2 | OC-SD-ISCO-2-XXX | 12/9/2010 | FS | No | South Ditch | 2500 | 28 | 1.12% | 1.12% | 1.12% |
| NPSED1 | NPSED1-SED1 | 11/20/2003 | FS | No | North Pond | 1320 | 57.8 | 4.38% | 4.38% | 4.38% |
| OPWD-SD-S | OC-SD-OPWD-SD/SO/SW-S-XXX | 12/10/2010 | FS | No | Off-Property West Ditch | 2400 | 7.1 U | 0.30% | 0.15% | |
| RSD-05 | RSD-05 | 1/18/2000 | FS | Yes | On-Property West Ditch | 1500 | 19 | 1.27% | 1.27% | 1.27% |
| SD-1 | OC-SD-SD-1-XXX | 12/9/2010 | FS | No | South Ditch | 1800 | 25 | 1.39% | 1.39% | 1.39% |
| SD-501 | OC-SD-SD-501-XXX | 12/17/2012 | FS | No | Central Pond | 19 | 0.21 | 1.11% | 1.11% | 1.11% |
| SD-502 | OC-SD-SD-502-XXX | 12/17/2012 | FS | No | Central Pond | 27 | 0.27 | 1.00% | 1.00% | 1.00% |
| SD-503 | OC-SD-SD-503-XXX | 12/17/2012 | FS | No | Detention Pond | 50 | 0.31 U | 0.62% | 0.31% | |
| SD-504 | OC-SD-SD-504-XXX | 12/17/2012 | FS | No | Detention Pond | 33 | 0.36 U | 1.09% | 0.55% | |
| SDC-1 | 1010-SED-SDC-1D | 9/17/2001 | FS | No | South Ditch | 380 | 11 | 2.89% | 2.89% | 2.89% |
| SDC-1 | 1010-SED-SDC-1S | 9/17/2001 | FS | No | South Ditch | 4000 | 2.1 U | 0.05% | 0.03% | |
| SDC-2 | 1010-SED-SDC-2S | 9/17/2001 | FS | No | South Ditch | 10000 | 2.4 U | 0.02% | 0.01% | |
| SDC-3 | 1010-SED-SDC-3D | 9/17/2001 | FS | No | South Ditch | 5300 | 27 | 0.51% | 0.51% | 0.51% |
| SDC-3 | 1010-SED-SDC-3S | 9/17/2001 | FS | No | South Ditch | 2300 | 1 U | 0.04% | 0.02% | |
| SDC-4 | 1010-SED-SDC-4D | 9/17/2001 | FS | No | South Ditch | 4800 | 2.2 U | 0.05% | 0.02% | |
| SDC-4 | 1010-SED-SDC-4S | 9/17/2001 | FS | No | South Ditch | 3600 | 0.9 U | 0.03% | 0.01% | |
| SDC-5 | 1010-SED-SDC-5D | 9/17/2001 | FS | No | South Ditch | 2800 | 1.2 U | 0.04% | 0.02% | |
| SDC-5 | 1010-SED-SDC-5S | 9/17/2001 | FS | No | South Ditch | 2700 | 0.84 U | 0.03% | 0.02% | |
| SDC-6 | 1010-SED-SDC-6D | 9/17/2001 | FS | No | South Ditch | 3300 | 0.8 U | 0.02% | 0.01% | |
| SDC-6 | 1010-SED-SDC-6S | 9/17/2001 | FS | No | South Ditch | 3000 | 1 U | 0.03% | 0.02% | |
| SDC-7 | 1010-SED-SDC-7D | 9/17/2001 | FS | No | South Ditch | 140 | 0.75 U | 0.54% | 0.27% | |
| SDC-7 | 1010-SED-SDC-7S | 9/17/2001 | FS | No | South Ditch | 6200 | 2 U | 0.03% | 0.02% | |
| SDC-8 | 1010-SED-SDC-8D | 9/17/2001 | FS | No | South Ditch | 3000 | 10 | 0.33% | 0.33% | 0.33% |
| SDC-8 | 1010-SED-SDC-8S | 9/17/2001 | FS | No | South Ditch | 4500 | 2.1 U | 0.05% | 0.02% | |
| SD-SD2 | OC-SD-SD-SD2-XXX | 12/10/2010 | FS | No | South Ditch | 240 | 3.3 U | 1.38% | 0.69% | |
| SD-SD3 | OC-SD-SD-SD3-XXX | 12/9/2010 | FS | No | South Ditch | 130 | 2.6 U | 2.00% | 1.00% | |
| SDSW-E | OC-SD-SDSW-E-XXX | 12/9/2010 | FS | No | South Ditch | 100 | 2.6 | 2.60% | 2.60% | 2.60% |
| SW-13 | SW-13 | 12/1/1992 | FS | Yes | On-Property West Ditch | 580 | 300 | 51.72% | 51.72% | 51.72% |
| SW-16 | SW-16 | 12/2/1992 | FS | No | Off-Property West Ditch | 8900 | 3.5 | 0.04% | 0.04% | 0.04% |
| SW-17 | SW-17 | 9/1/1992 | FS | No | Off-Property West Ditch | 520 | 30 | 5.77% | 5.77% | 5.77% |
| SW-17 | SW-17 | 12/2/1992 | FS | No | Off-Property West Ditch | 4000 | 110 | 2.75% | 2.75% | 2.75% |
| SW-23 | SW-23 | 12/2/1992 | FS | No | East Ditch | 1500 | 33 | 2.20% | 2.20% | 2.20% |
| SW-6 | SW-06 | 12/1/1992 | FS | No | South Ditch | 3200 | 87 | 2.72% | 2.72% | 2.72% |
| SW-8 | SW-08 | 12/1/1992 | FS | Yes | Central Pond | 2100 | 21 | 1.00% | 1.00% | 1.00% |

1 - Ratios are hexavalent chromium divided by chromium.

2 - 95% Upper Confidence Limits calculated using ProUCL 5.0.00

FS - Field Sample

FD - Field Duplicate

U - Not Detected, Value is Reporting Limit

| | | | |
|--------------|--------|--------|--------|
| Average: | 4.06% | 2.95% | 4.45% |
| 95% UCL (2): | 13.10% | 10.40% | 16.00% |

Prepared by: LCG

Checked by: BJR

Table 4
 Hexavalent Chromium Data Sets Used for EPCs
 Human Health Risk Assessment - OU1 and OU2
 Olin Chemical Superfund Site
 Wilmington, Massachusetts

| Media | Exposure Area | Location | Sample ID | Sample Date | Depth (ft) | Total Chromium Result (mg/kg) | Hexavalent Chromium Result (mg/kg) | Combine Hexavalent Chromium Data Set (mg/kg) (1) |
|-----------------|---------------|-----------------------|-----------|-------------|------------|-------------------------------|------------------------------------|--|
| Subsurface Soil | EA3 | BH32-RISK | BH32 | 6/11/1991 | 4-6 | 5 | | 0.291 |
| | | BH33 | BH33 | 6/11/1991 | 6-8 | 5.1 | | 0.29682 |
| | | BH34 | BH34 | 6/11/1991 | 6-8 | 4.2 | | 0.24444 |
| | | BH35 | BH35 | 6/11/1991 | 6-8 | 5.1 | | 0.29682 |
| | | OC-SB-417-8_0/10-XXX | SB-417 | 9/10/2009 | | 5.4 | | 0.31428 |
| | | OC-SB-427-8_0/10-RISK | SB-427 | 9/10/2009 | | 5.4 | | 0.31428 |
| | | OC-SB-428-8_0/10-RISK | SB-428 | 9/10/2009 | | 6.5 | | 0.3783 |
| | | OC-SB-434-7_0/9_0-XXX | SB-434 | 9/10/2009 | | 6.6 | | 0.38412 |
| | | OC-SB-441-8_0/10-XXX | SB-441 | 8/24/2009 | | 8.6 | | 0.50052 |
| | | OC-SB-442-8_0/10-RISK | SB-442 | 8/31/2009 | | 13 | | 0.7566 |
| | | OC-SB-508-8_0/10-XXX | SB-508 | 12/11/2012 | | | 1.1 | J |
| | | | | | | | | 1.1 |
| | | | | | | | | J |
| Subsurface Soil | EA7 | 1160-RS0-06-N | RS0-06-N | 11/9/2000 | 4-6 | 19 | | 1.1058 |
| | | BH27 | BH27 | 6/11/1991 | 4-6 | 11 | | 0.6402 |
| | | BH28 RISK | BH28 | 6/11/1991 | 4-6 | 6.2 | | 0.36084 |
| | | BH29 | BH29 | 6/11/1991 | 4-6 | 8.2 | | 0.47724 |
| | | BH30 | BH30 | 6/11/1991 | 8-10 | 6.3 | | 0.36666 |
| | | OC-SB-405-8_0/9_0-XXX | SB-405 | 8/18/2009 | | 21 | | 1.2222 |
| | | OC-SB-416-8_0/9_0-XXX | SB-416 | 8/18/2009 | | 16 | | 0.9312 |
| | | OC-SB-420-6_5/8_5-XXX | SB-420 | 8/18/2009 | | 18 | | 1.0476 |
| | | OC-SB-421-8_0/10-XXX | SB-421 | 8/19/2009 | | 12 | | 0.6984 |
| | | OC-SB-423-5_0/6_0-XXX | SB-423 | 8/18/2009 | | 33 | | 1.9206 |
| | | OC-SB-424-7_0/9_0-XXX | SB-424 | 8/19/2009 | | 23 | | 1.3386 |
| | | OC-SB-425-6_0/8_0-XXX | SB-425 | 8/19/2009 | | 9.6 | | 0.55872 |
| | | OC-SB-505-5_0/7_0-XXX | SB-505 | 12/11/2012 | | | 0.58 | J |
| | | RSO-01-S1 | RSO-01 | 1/25/2000 | 0-3 | 8.1 | | 0.47142 |
| | | RSO-01-S2 | RSO-01 | 1/25/2000 | 3-6 | 6.6 | | 0.38412 |
| | | RSO-02-S1 | RSO-02 | 1/25/2000 | 0-3 | 8.3 | | 0.48306 |
| | | RSO-02-S2 | RSO-02 | 1/25/2000 | 3-6 | 9.1 | | 0.52962 |
| Surface Soil | EA3 | OC-SB-417-0_0/1_0-XXX | SB-417 | 9/10/2009 | | 7.9 | | 0.45978 |
| | | OC-SB-427-0_0/1_0-XXX | SB-427 | 9/10/2009 | | 12 | J | 0.6984 |
| | | OC-SB-428-0_0/1_0-XXX | SB-428 | 9/10/2009 | | 20 | J | 1.164 |
| | | OC-SB-434-0_0/1_0-XXX | SB-434 | 9/10/2009 | | 30 | | 1.746 |
| | | OC-SB-441-0_0/1_0-XXX | SB-441 | 8/24/2009 | | 29 | | 1.6878 |
| | | OC-SB-442-0_0/1_0-XXX | SB-442 | 8/31/2009 | | 22 | | 1.2804 |
| | | OC-SB-508-0_0/1_0-XXX | SB-508 | 12/11/2012 | | | 3 | UJ |
| | | OC-SS-409-0_0/1_0-XXX | SS-409 | 9/15/2009 | | 21 | | 1.2222 |
| | | SWMU-25 | SWMU-25 | 5/7/1993 | 0-0 | 19 | | 1.1058 UJ |
| Surface Soil | EA7 | AREA 05 | AREA-5 | 7/9/1991 | 0-1 | 12 | | 0.6984 |
| | | OC-SB-405-0_0/1_0-XXX | SB-405 | 8/18/2009 | | 7 | | 0.4074 |
| | | OC-SB-416-0_0/1_0-XXX | SB-416 | 8/18/2009 | | 7.5 | | 0.4365 |
| | | OC-SB-420-0_0/1_0-XXX | SB-420 | 8/18/2009 | | 15 | | 0.873 |
| | | OC-SB-421-0_0/1_0-XXX | SB-421 | 8/19/2009 | | 34 | | 1.9788 |
| | | OC-SB-423-0_0/1_0-XXX | SB-423 | 8/18/2009 | | 15 | | 0.873 |
| | | OC-SB-424-0_0/1_0-XXX | SB-424 | 8/19/2009 | | 24 | | 1.3968 |
| | | OC-SB-425-0_0/1_0-XXX | SB-425 | 8/19/2009 | | 19 | | 1.1058 |
| | | OC-SB-505-0_0/1_0-XXX | SB-505 | 12/11/2012 | | | 0.34 | J |
| | | OC-SS-405-0_0/1_0-XXX | SS-405 | 9/14/2009 | | 8 | | 0.4656 |
| Surface Soil | Containment | OC-SS-420-0_0/1_0-XXX | SS-420 | 9/15/2009 | | 48 | | 2.7936 |
| | | OC-SS-421-0_0/1_0-XXX | SS-421 | 9/15/2009 | | 52 | | 3.0264 |
| | | OC-SS-422-0_0/1_0-XXX | SS-422 | 9/15/2009 | | 36 | | 2.0952 |
| | | OC-SS-423-0_0/1_0-XXX | SS-423 | 9/15/2009 | | 60 | | 3.492 |
| | | OC-SS-424-0_0/1_0-XXX | SS-424 | 9/15/2009 | | 55 | | 3.201 |
| | | OC-SS-425-0_0/1_0-XXX | SS-425 | 9/15/2009 | | 75 | | 4.365 |
| | | OC-SS-426-0_0/1_0-XXX | SS-426 | 9/16/2009 | | 28 | | 1.6296 |
| | | OC-SS-429-0_0/1_0-XXX | SS-429 | 9/16/2009 | | 87 | | 5.0634 |
| | | OC-SS-430-0_0/1_0-XXX | SS-430 | 9/16/2009 | | 66 | | 3.8412 |
| | | OC-SS-431-0_0/1_0-XXX | SS-431 | 9/16/2009 | | 59 | | 3.4338 |

Table 4
 Hexavalent Chromium Data Sets Used for EPCs
 Human Health Risk Assessment - OU1 and OU2
 Olin Chemical Superfund Site
 Wilmington, Massachusetts

| Media | Exposure Area | Location | Sample ID | Sample Date | Depth (ft) | Total Chromium Result (mg/kg) | Hexavalent Chromium Result (mg/kg) | Combine Hexavalent Chromium Data Set (mg/kg) (1) |
|----------|-----------------|---------------------------|-----------|-------------|------------|-------------------------------|------------------------------------|--|
| Sediment | Detention Basin | OC-SD-SD-503-XXX | SD-503 | 12/17/2012 | | 50 | 0.31 | UJ |
| | | OC-SD-SD-504-XXX | SD-504 | 12/17/2012 | | 33 | 0.36 | UJ |
| Sediment | Central Pond | OC-SD-SD4 | SD-SD4 | 11/16/2007 | - | 18 | | 2.88 |
| | | OC-SD-SD4 | SD-SD4 | 11/16/2012 | 0-0_5 | 24 | | 3.84 |
| | | OC-SD-SD4 | SD-SD4 | 11/19/2008 | 0-0_5 | 26 | J | 4.16 |
| | | OC-SD-SD4 | SD-SD4 | 11/21/2013 | 0-0_5 | 15 | | 2.4 |
| | | OC-SD-SD4-0_0/0_5 | SD-SD4 | 11/11/2011 | 0-0_5 | 140 | | 22.4 |
| | | OC-SD-SD4-0_0/0_5 | SD-SD4 | 11/15/2010 | 0-0_5 | 23 | | 3.68 |
| | | OC-SD-SD-501-XXX | SD-501 | 12/17/2012 | | 19 | 0.21 | J |
| | | OC-SD-SD-502-XXX | SD-502 | 12/17/2012 | | 27 | 0.27 | J |
| | | OC-SD-SD-SD4-0_0/0_5 | SD-SD4 | 11/11/2009 | 0-0_5 | 25 | | 4 |
| | | SD-SD4-03-03 | SD-SD4 | 5/19/2005 | 0-0_25 | 43 | | 6.88 |
| Sediment | On-PWD | 1120-WDW-12S | WDW-12 | 8/30/2000 | (0-6) | 11 | | 1.76 |
| | | 1120-WDW-13S | WDW-13 | 8/30/2000 | (0-6) | 19 | | 3.04 |
| | | 1120-WDW-14S | WDW-14 | 8/31/2000 | (0-6) | 11 | | 1.76 |
| | | 1120-WDW-16S | WDW-16 | 8/31/2000 | (0-6) | 29 | | 4.64 |
| | | 1120-WDW-17S | WDW-17 | 8/30/2000 | (0-6) | 17 | | 2.72 |
| | | 1120-WDW-19S | WDW-19 | 8/30/2000 | (0-6) | 69 | | 11.04 |
| | | 1120-WDW-21AS | WDW-21A | 8/30/2000 | (0-6) | 22 | | 3.52 |
| | | 1120-WDW-21BS | WDW-21B | 8/30/2000 | (0-6) | 42 | | 6.72 |
| | | 1120-WDW-22S | WDW-22 | 8/30/2000 | (0-6) | 21 | | 3.36 |
| | | 1120-WDW-23S | WDW-23 | 8/31/2000 | (0-6) | 22 | | 3.52 |
| | | 1120-WDW-24S | WDW-24 | 8/30/2000 | (0-6) | 48 | | 7.68 |
| | | 1120-WDW-25S | WDW-25 | 8/30/2000 | (0-6) | 19 | | 3.04 |
| | | 1120-WDW-27S | WDW-27 | 8/31/2000 | (0-6) | 42 | | 6.72 |
| | | 1120-WDW-28S | WDW-28 | 8/30/2000 | (0-6) | 15 | | 2.4 |
| | | 1120-WDW-29S | WDW-29 | 8/30/2000 | (0-6) | 28 | | 4.48 |
| | | 1120-WDW-30S | WDW-30 | 8/30/2000 | 0-0_5 | 10 | | 1.6 |
| | | 1120-WDW-31S | WDW-31 | 8/30/2000 | 0-0_5 | 29 | | 4.64 |
| | | 1120-WDW-32S | WDW-32 | 8/31/2000 | 0-0_5 | 19 | | 3.04 |
| | | 1140-WDW-11S | WDW-11 | 8/25/2000 | 0-0_5 | 13 | | 2.08 |
| | | OC-SD-SD1 | SD-SD1 | 11/16/2012 | 0-0_5 | 67 | | 10.72 |
| | | OC-SD-SD1 | SD-SD1 | 11/19/2008 | 0-0_3 | 29 | J | 4.64 J |
| Sediment | Off-PWD | OC-SD-OPWD-1-XXX | OPWD-1 | 12/10/2010 | 0-0_5 | 1400 | | 224 |
| | | OC-SD-OPWD-2-XXX | OPWD-2 | 12/10/2010 | 0-0_5 | 250 | | 40 |
| | | OC-SD-OPWD-SD/SO/SW-S-XXX | OPWD-SD-S | 12/10/2010 | 0-0_- | 2400 | J 7.1 | U 3.55 |
| Sediment | EA4 | BS031LSD-02 | BS031 | 8/22/2005 | 0-0_5 | 570 | 7.9 | 7.9 |
| | | BS032LSD-02 | BS032 | 8/22/2005 | 0-0_5 | 860 | 6.9 | U 137.6 |
| | | OC-SD-SD-1-XXX | SD-1 | 12/9/2010 | 0-0_5 | 1800 | 25 | 25 |
| | | OC-SD-SD2 | SD-SD2 | 11/16/2007 | - | 110 | | 17.6 |
| | | OC-SD-SD2 | SD-SD2 | 11/16/2012 | 0-0_5 | 430 | | 68.8 |
| | | OC-SD-SD2 | SD-SD2 | 11/19/2008 | 0-0_4 | 620 | J | 99.2 |
| | | OC-SD-SD2 | SD-SD2 | 11/21/2013 | 0-0_5 | 94 | | 15.04 |
| | | OC-SD-SD2-0_0/0_5 | SD-SD2 | 11/11/2011 | 0-0_5 | 130 | | 20.8 |
| | | OC-SD-SD2-0_0/0_5-RISK | SD-SD2 | 11/15/2010 | 0-0_5 | 260 | J | 41.6 |
| | | OC-SD-SD3 | SD-SD3 | 11/16/2007 | - | 120 | | 19.2 |
| | | OC-SD-SD3 | SD-SD3 | 11/16/2012 | 0-0_5 | 41 | | 6.56 |
| | | OC-SD-SD3 | SD-SD3 | 11/19/2008 | 0-0_4 | 130 | J | 20.8 |
| | | OC-SD-SD3 | SD-SD3 | 11/21/2013 | 0-0_5 | 29 | | 4.64 |
| | | OC-SD-SD3-0_0/0_5 | SD-SD3 | 11/15/2010 | 0-0_5 | 20 | | 3.2 |
| | | OC-SD-SD3-0_0/0_5-RISK | SD-SD3 | 11/11/2011 | 0-0_5 | 40 | | 6.4 |
| | | OC-SD-SD5 | SD-SD5 | 11/16/2007 | - | 1600 | | 256 |
| | | OC-SD-SD5 | SD-SD5 | 11/19/2008 | 0-0_4 | 340 | J | 54.4 |
| | | OC-SD-SD5 | SD-SD5 | 11/21/2013 | 0-0_5 | 99 | | 15.84 |
| | | OC-SD-SD5-0_0/0_5 | SD-SD5 | 11/11/2011 | 0-0_5 | 59 | | 9.44 |
| | | OC-SD-SD5-0_0/0_5 | SD-SD5 | 11/15/2010 | 0-0_5 | 1800 | | 288 |
| | | OC-SD-SD5-RISK | SD-SD5 | 11/16/2012 | 0-0_5 | 455 | | 72.8 |

Table 4
 Hexavalent Chromium Data Sets Used for EPCs
 Human Health Risk Assessment - OU1 and OU2
 Olin Chemical Superfund Site
 Wilmington, Massachusetts

| Media | Exposure Area | Location | Sample ID | Sample Date | Depth (ft) | Total Chromium Result (mg/kg) | Hexavalent Chromium Result (mg/kg) | Combine Hexavalent Chromium Data Set (mg/kg) (1) |
|---------------|--------------------|-----------------------------|-------------------|-------------|------------|-------------------------------|------------------------------------|--|
| Sediment | EA4 (cont) | OC-SD-SD-SD2-0_0/0_5 | SD-SD2 | 11/11/2009 | 0-0_5 | 77 | | 12.32 |
| | | OC-SD-SD-SD2-RISK | SD-SD2 | 12/10/2010 | 0-0_5 | 270 | 3.3 | 43.2 |
| | | OC-SD-SD-SD3-0_0/0_5 | SD-SD3 | 11/11/2009 | 0-0_5 | 20 | | 3.2 |
| | | OC-SD-SD-SD3-XXX | SD-SD3 | 12/9/2010 | 0-0_5 | 130 | 2.6 | 20.8 |
| | | OC-SD-SD-SD5-0_0/0_5 | SD-SD5 | 11/11/2009 | 0-0_5 | 320 | | 51.2 |
| | | OC-SD-SDSW-E-XXX | SDSW-E | 12/9/2010 | 0-0_5 | 100 | 2.6 | 2.6 |
| | | SD-SD2-03-03 | SD-SD2 | 5/19/2005 | 0-0_25 | 25 | | 4 |
| | | SD-SD3-03-03 | SD-SD3 | 5/19/2005 | 0-0_25 | 190 | | 30.4 |
| | | SD-SD5-03-03 | SD-SD5 | 5/19/2005 | 0-0_25 | 1400 | | 224 |
| | | | | | | | | |
| Sediment | EA5 | BS030LSD-02 | BS030 | 8/22/2005 | 0-0_5 | 2800 | 8 | 8 |
| | | OC-SD-ISCO-2-XXX | ISCO2 | 12/9/2010 | 0-0_5 | 2500 | 28 | 28 |
| | | OC-SD-ISCO-2-XXX | ISCO2 | 2/17/2011 | | 3000 | | 480 |
| Sediment | East Ditch | OC-SD-EDSD/SW2 (EDBS6)-XXX | EDSD/SW2 (EDBS6) | 12/13/2010 | | 31 | J | 4.96 |
| | | OC-SD-EDSD/SW7-XXX | EDSD/SW7 | 11/6/2012 | | 78 | J | 12.48 |
| | | OC-SD-EDSD/SW7-XXX | EDSD/SW7 | 6/18/2012 | 0-0_5 | 39 | | 6.24 |
| Sediment | Maple Meadow Brook | OC-SD-MMB-SW/SD-10-XXX | MMB-SW/SD-10 | 12/2/2010 | 0-0_5 | 16 | | 2.56 |
| | | OC-SD-MMB-SW/SD-11-XXX | MMB-SW/SD-11 | 12/2/2010 | 0-0_5 | 27 | | 4.32 |
| | | OC-SD-MMB-SW/SD-1-XXX | MMB-SW/SD-1 | 12/1/2010 | 0-0_5 | 29 | | 4.64 |
| | | OC-SD-MMB-SW/SD-1-XXX | MMB-SW/SD-1 | 2/17/2011 | | 11 | | 1.76 |
| | | OC-SD-MMB-SW/SD-2-XXX | MMB-SW/SD-2 | 12/3/2010 | 0-0_5 | 20 | | 3.2 |
| | | OC-SD-MMB-SW/SD-3-XXX | MMB-SW/SD-3 | 12/3/2010 | 0-0_5 | 16 | | 2.56 |
| | | OC-SD-MMB-SW/SD-4-XXX | MMB-SW/SD-4 | 12/2/2010 | 0-0_5 | 8.5 | | 1.36 |
| | | OC-SD-MMB-SW/SD-5-XXX | MMB-SW/SD-5 | 12/2/2010 | 0-0_5 | 24 | | 3.84 |
| | | OC-SD-MMB-SW/SD-6-XXX | MMB-SW/SD-6 | 12/3/2010 | 0-0_5 | 40 | | 6.4 |
| | | OC-SD-MMB-SW/SD-8A-XXX | MMB-SW/SD-8A | 12/2/2010 | 0-0_5 | 38 | | 6.08 |
| | | OC-SD-MMB-SW/SD-8-RISK | MMB-SW/SD-8 | 12/2/2010 | 0-0_5 | 39 | | 6.24 |
| | | OC-SD-MMB-SW/SD-9-XXX | MMB-SW/SD-9 | 12/1/2010 | 0-0_5 | 7.5 | | 1.2 |
| | | OC-SD-SDREF-012-XXX | SDREF-012 | 12/3/2010 | 0-0_5 | 11 | | 1.76 |
| Surface Water | East Ditch | OC-ISCO3 | ISCO3 | 11/21/2013 | | 0.0016 | J | 0.00008784 |
| | | OC-ISCO3 | ISCO3 | 3/21/2013 | | 0.005 | U | 0.0002745 |
| | | OC-ISCO3 | ISCO3 | 5/13/2013 | | 0.005 | U | 0.0002745 |
| | | OC-ISCO3 | ISCO3 | 8/22/2013 | | 0.005 | U | 0.0002745 |
| | | OC-ISCO3-SW | ISCO3 | 2/23/2012 | | 0.00068 | J | 0.000037332 |
| | | OC-SW-EDSD/SW0-XXX | EDSD/SW0 | 12/13/2010 | | 0.005 | U | 0.0002745 |
| | | OC-SW-EDSD/SW1 (EDBS5)-XXX | EDSD/SW1 (EDBS5) | 12/13/2010 | | 0.005 | U | 0.0002745 |
| | | OC-SW-EDSD/SW1(EDBS5)-XXX | EDSD/SW1 (EDBS5) | 6/8/2011 | | 0.005 | U | 0.0002745 |
| | | OC-SW-EDSD/SW2 (EDBS6)-XXX | EDSD/SW2 (EDBS6) | 12/13/2010 | | 0.005 | U | 0.0005 |
| | | OC-SW-EDSD/SW2(EDBS6)-XXX | EDSD/SW2 (EDBS6) | 6/8/2011 | | 0.005 | U | 0.00056 |
| | | OC-SW-EDSD/SW5 (EDBS11)-XXX | EDSD/SW5 (EDBS11) | 12/13/2010 | | 0.065 | | 0.00086 |
| | | OC-SW-EDSD/SW5(EDBS11)-XXX | EDSD/SW5 (EDBS11) | 6/8/2011 | | 0.004 | J | 0.001 |
| | | OC-SW-EDSD/SW7-XXX | EDSD/SW7 | 11/6/2012 | | 0.0041 | J | 0.00022509 |
| | | OC-SW-EDSD/SW7-XXX | EDSD/SW7 | 6/18/2012 | | 0.0087 | | 0.00047763 |
| | | OC-SW-ISCO3 | ISCO3 | 11/16/2012 | | 0.005 | U | 0.0002745 |
| | | OC-SW-ISCO3 | ISCO3 | 11/8/2011 | | 0.002 | J | 0.0001098 |
| | | OC-SW-ISCO3 | ISCO3 | 3/22/2011 | | 0.0013 | J | 0.00007137 |
| | | OC-SW-ISCO3 | ISCO3 | 5/16/2011 | | 0.005 | U | 0.0002745 |
| | | OC-SW-ISCO3 | ISCO3 | 6/7/2012 | | 0.005 | U | 0.0002745 |
| | | OC-SW-ISCO3 | ISCO3 | 8/23/2011 | | 0.0012 | J | 0.00006588 |
| | | OC-SW-ISCO3 | ISCO3 | 8/23/2012 | | 0.0035 | J | 0.00019215 |
| | | OC-SW-SD-EDSD/SW0-XXX | EDSD/SW0 | 6/8/2011 | | 0.0014 | | 0.00007686 |

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 Human Health Risk Assessment - OU1 and OU2
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| Media | Exposure Area | Location | Sample ID | Sample Date | Depth (ft) | Total Chromium Result (mg/kg) | Hexavalent Chromium Result (mg/kg) | Combine Hexavalent Chromium Data Set (mg/kg) (1) |
|---------------|--------------------|---------------------------|--------------|-------------|------------|-------------------------------|------------------------------------|--|
| Surface Water | Maple Meadow Brook | OC-SW-MMB-SW/SD-10-XXX | MMB-SW/SD-10 | 12/2/2010 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-10-XXX | MMB-SW/SD-10 | 6/6/2011 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-11-XXX | MMB-SW/SD-11 | 12/2/2010 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-11-XXX | MMB-SW/SD-11 | 6/7/2011 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-1-RISK | MMB-SW/SD-1 | 6/6/2011 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-1-XXX | MMB-SW/SD-1 | 12/1/2010 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-2-XXX | MMB-SW/SD-2 | 12/3/2010 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-2-XXX | MMB-SW/SD-2 | 6/8/2011 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-3-XXX | MMB-SW/SD-3 | 12/3/2010 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-3-XXX | MMB-SW/SD-3 | 6/8/2011 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-4-XXX | MMB-SW/SD-4 | 12/2/2010 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-4-XXX | MMB-SW/SD-4 | 6/6/2011 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-5-XXX | MMB-SW/SD-5 | 12/2/2010 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-5-XXX | MMB-SW/SD-5 | 6/7/2011 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-6-XXX | MMB-SW/SD-6 | 12/3/2010 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-6-XXX | MMB-SW/SD-6 | 6/8/2011 | | 0.00098 | | 0.000053802 |
| | | OC-SW-MMB-SW/SD-8A-XXX | MMB-SW/SD-8A | 12/2/2010 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-8A-XXX | MMB-SW/SD-8A | 6/8/2011 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-8-RISK | MMB-SW/SD-8 | 12/2/2010 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-8-XXX | MMB-SW/SD-8 | 6/7/2011 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-9-XXX | MMB-SW/SD-9 | 12/1/2010 | | 0.005 | U | 0.0002745 |
| | | OC-SW-MMB-SW/SD-9-XXX | MMB-SW/SD-9 | 6/6/2011 | | 0.005 | U | 0.0002745 |
| Surface Water | Off-PWD | OC-SW-OPWD-1-XXX | OPWD-1 | 12/10/2010 | | 0.13 | | 0.007137 |
| | | OC-SW-OPWD-1-XXX | OPWD-1 | 6/7/2011 | | 0.099 | | 0.0054351 |
| | | OC-SW-OPWD-2-XXX | OPWD-2 | 12/10/2010 | | 0.0061 | | 0.00033489 |
| | | OC-SW-OPWD-2-XXX | OPWD-2 | 6/7/2011 | | 0.013 | | 0.0007137 |
| | | OC-SW-OPWD-SD/SO/SW-S-XXX | OPWD-SW-S | 12/10/2010 | | 0.037 | 0.001 | U 0.0005 |
| | | OC-SW-OPWD-SD/SO/SW-S-XXX | OPWD-SW-S | 6/7/2011 | | 0.012 | 0.001 | U 0.0005 |
| Surface Water | South Ditch Lower | OC-ISCO 2 | ISCO2 | 9/1/2010 | | 0.065 | | 0.0035685 |
| | | OC-ISCO2 | ISCO2 | 11/21/2013 | | 0.18 | | 0.009882 |
| | | OC-ISCO-2 | ISCO2 | 2/24/2009 | | 0.25 | | 0.013725 |
| | | OC-ISCO2 | ISCO2 | 3/21/2013 | | 0.13 | | 0.007137 |
| | | OC-ISCO-2 | ISCO2 | 5/12/2009 | | 0.53 | | 0.029097 |
| | | OC-ISCO2 | ISCO2 | 5/13/2013 | | 0.064 | | 0.0035136 |
| | | OC-ISCO-2 | ISCO2 | 8/12/2009 | | 2.2 | | 0.12078 |
| | | OC-ISCO2 | ISCO2 | 8/22/2013 | | 0.34 | | 0.018666 |
| | | OC-ISCO2-SW | ISCO2 | 2/23/2012 | | 0.073 | | 0.0040077 |
| | | OC-SW-ISCO2 | ISCO2 | 11/12/2009 | | 0.068 | | 0.0037332 |
| | | OC-SW-ISCO2 | ISCO2 | 11/15/2010 | | 0.047 | | 0.0025803 |
| | | OC-SW-ISCO2 | ISCO2 | 11/16/2012 | | 0.074 | | 0.0040626 |
| | | OC-SW-ISCO2 | ISCO2 | 11/8/2011 | | 0.75 | | 0.041175 |
| | | OC-SW-ISCO2 | ISCO2 | 3/22/2011 | | 0.26 | | 0.014274 |
| | | OC-SW-ISCO2 | ISCO2 | 5/16/2011 | | 0.065 | | 0.0035685 |
| | | OC-SW-ISCO2 | ISCO2 | 6/7/2012 | | 0.17 | | 0.009333 |
| | | OC-SW-ISCO2 | ISCO2 | 6/9/2010 | | 0.32 | | 0.017568 |
| | | OC-SW-ISCO2 | ISCO2 | 8/23/2011 | | 0.051 | | 0.0027999 |
| | | OC-SW-ISCO2 | ISCO2 | 8/23/2012 | | 0.03 | | 0.001647 |
| | | OC-SW-ISCO-2_2 | ISCO2 | 2/18/2010 | | 0.81 | | 0.044469 |
| | | OC-SW-ISCO-2-XXX | ISCO2 | 12/9/2010 | | 0.11 | | 0.006039 |
| | | OC-SW-ISCO-2-XXX | ISCO2 | 6/6/2011 | | 1.1 | 0.001 | UJ 0.0005 |

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| Media | Exposure Area | Location | Sample ID | Sample Date | Depth (ft) | Total Chromium Result (mg/kg) | Hexavalent Chromium Result (mg/kg) | Combine Hexavalent Chromium Data Set (mg/kg) (1) |
|---------------|-------------------|-------------------|-----------|-------------|------------|-------------------------------|------------------------------------|--|
| Surface Water | South Ditch Upper | OC-ISCO 1 | ISCO1 | 9/1/2010 | | 0.015 | | 0.000891 |
| | | OC-ISCO1 | ISCO1 | 11/21/2013 | | 0.012 | | 0.0007128 |
| | | OC-ISCO-1 | ISCO1 | 2/24/2009 | | 0.044 | | 0.0026136 |
| | | OC-ISCO1 | ISCO1 | 3/21/2013 | | 0.013 | | 0.0007722 |
| | | OC-ISCO-1 | ISCO1 | 5/12/2009 | | 0.026 | | 0.0015444 |
| | | OC-ISCO1 | ISCO1 | 5/13/2013 | | 0.011 | | 0.0006534 |
| | | OC-ISCO-1 | ISCO1 | 8/12/2009 | | 0.017 | | 0.0010098 |
| | | OC-ISCO1 | ISCO1 | 8/22/2013 | | 0.0089 | | 0.00052866 |
| | | OC-ISCO1-SW | ISCO1 | 2/23/2012 | | 0.015 | | 0.000891 |
| | | OC-PZ 16 RR SW | PZ-16RR | 9/1/2010 | | 0.22 | | 0.013068 |
| | | OC-PZ 17 RR SW | PZ-17RR | 9/1/2010 | | 0.21 | | 0.012474 |
| | | OC-PZ 18 R SW | PZ-18R | 9/1/2010 | | 0.018 | | 0.0010692 |
| | | OC-PZ-16RR | PZ-16RR | 8/12/2009 | | 1.7 | | 0.10098 |
| | | OC-PZ-16RRSW | PZ-16RR | 11/21/2013 | | 0.041 | | 0.0024354 |
| | | OC-PZ-16RRSW | PZ-16RR | 2/24/2009 | | 0.74 | | 0.043956 |
| | | OC-PZ-16RRSW | PZ-16RR | 3/21/2013 | | 0.37 | | 0.021978 |
| | | OC-PZ16RRSW | PZ-16RR | 5/12/2009 | | 0.54 | | 0.032076 |
| | | OC-PZ-16RRSW | PZ-16RR | 5/13/2013 | | 0.34 | | 0.020196 |
| | | OC-PZ-16RRSW | PZ-16RR | 8/22/2013 | | 0.67 | | 0.039798 |
| | | OC-PZ-17RR | PZ-17RR | 8/12/2009 | | 22 | | 1.3068 |
| | | OC-PZ-17RRRSW | PZ-17RR | 8/22/2013 | | 2.4 | | 0.14256 |
| | | OC-PZ-17RRSW | PZ-17RR | 11/21/2013 | | 0.64 | | 0.038016 |
| | | OC-PZ-17RRSW | PZ-17RR | 2/24/2009 | | 0.88 | | 0.052272 |
| | | OC-PZ-17RRSW | PZ-17RR | 3/21/2013 | | 0.41 | | 0.024354 |
| | | OC-PZ17RRSW | PZ-17RR | 5/12/2009 | | 0.6 | | 0.03564 |
| | | OC-PZ-17RRSW | PZ-17RR | 5/13/2013 | | 0.52 | | 0.030888 |
| | | OC-PZ-18R-RISK | PZ-18R | 8/12/2009 | | 0.014 | | 0.0008316 |
| | | OC-PZ18R-SW | PZ-18R | 2/23/2012 | | 0.014 | | 0.0008316 |
| | | OC-PZ-18RSW | PZ-18R | 2/24/2009 | | 0.047 | | 0.0027918 |
| | | OC-PZ-18RSW | PZ-18R | 3/21/2013 | | 0.012 | | 0.0007128 |
| | | OC-PZ18RSW | PZ-18R | 5/12/2009 | | 0.022 | | 0.0013068 |
| | | OC-PZ-18RSW | PZ-18R | 8/22/2013 | | 0.0085 | | 0.0005049 |
| | | OC-PZ-18RSW-RISK | PZ-18R | 11/21/2013 | | 0.012 | | 0.0007128 |
| | | OC-PZ-18RSW-RISK | PZ-18R | 5/13/2013 | | 0.012 | | 0.0007128 |
| | | OC-SD-17 | SD-17 | 11/21/2013 | | 1.3 | | 0.07722 |
| | | OC-SD-17 | SD-17 | 2/24/2009 | | 0.87 | | 0.051678 |
| | | OC-SD17 | SD-17 | 5/12/2009 | | 0.58 | | 0.034452 |
| | | OC-SD-17 | SD-17 | 5/13/2013 | | 0.5 | | 0.0297 |
| | | OC-SD-17 | SD-17 | 8/12/2009 | | 64 | | 3.8016 |
| | | OC-SD-17 | SD-17 | 8/22/2013 | | 5.7 | | 0.33858 |
| | | OC-SD-17 SW | SD-17 | 3/21/2013 | | 0.36 | | 0.021384 |
| | | OC-SD-17-SW | SD-17 | 2/23/2012 | | 0.37 | | 0.021978 |
| | | OC-SD17SW | SD-17 | 9/9/2010 | | 0.29 | | 0.017226 |
| | | OC-SW-18R-RISK | PZ-18R | 11/12/2009 | | 0.035 | | 0.002079 |
| | | OC-SW-ISCO1 | ISCO1 | 11/12/2009 | | 0.034 | | 0.0020196 |
| | | OC-SW-ISCO1 | ISCO1 | 11/15/2010 | | 0.027 | | 0.0016038 |
| | | OC-SW-ISCO1 | ISCO1 | 11/16/2012 | | 0.019 | | 0.0011286 |
| | | OC-SW-ISCO1 | ISCO1 | 11/8/2011 | | 0.03 | | 0.001782 |
| | | OC-SW-ISCO1 | ISCO1 | 3/22/2011 | | 0.016 | | 0.0009504 |
| | | OC-SW-ISCO1 | ISCO1 | 5/16/2011 | | 0.012 | | 0.0007128 |
| | | OC-SW-ISCO1 | ISCO1 | 6/7/2012 | | 0.0096 | | 0.00057024 |
| | | OC-SW-ISCO1 | ISCO1 | 6/9/2010 | | 0.019 | | 0.0011286 |
| | | OC-SW-ISCO1 | ISCO1 | 8/23/2011 | | 0.016 | | 0.0009504 |
| | | OC-SW-ISCO1 | ISCO1 | 8/23/2012 | | 0.013 | | 0.0007722 |
| | | OC-SW-ISCO-1-0_2 | ISCO1 | 2/18/2010 | | 0.02 | | 0.001188 |
| | | OC-SW-ISCO-1-RISK | ISCO1 | 12/10/2010 | | 0.027 | | 0.0016038 |
| | | OC-SW-ISCO-1-RISK | ISCO1 | 6/6/2011 | | 0.012 | 0.001 | U 0.0005 |

Table 4
 Hexavalent Chromium Data Sets Used for EPCs
 Human Health Risk Assessment - OU1 and OU2
 Olin Chemical Superfund Site
 Wilmington, Massachusetts

| Media | Exposure Area | Location | Sample ID | Sample Date | Depth (ft) | Total Chromium Result (mg/kg) | Hexavalent Chromium Result (mg/kg) | Combine Hexavalent Chromium Data Set (mg/kg) (1) |
|---------------|--------------------------|------------------------|-----------|-------------|------------|-------------------------------|------------------------------------|--|
| Surface Water | South Ditch Upper (cont) | OC-SW-PZ16RR | PZ-16RR | 11/12/2009 | | 1 | | 0.0594 |
| | | OC-SW-PZ-16RR | PZ-16RR | 11/15/2010 | | 0.39 | | 0.023166 |
| | | OC-SW-PZ16RR | PZ-16RR | 11/8/2011 | | 0.38 | | 0.022572 |
| | | OC-SW-PZ-16RR | PZ-16RR | 6/9/2010 | | 0.97 | | 0.057618 |
| | | OC-SW-PZ-16RR-0_2-RISK | PZ-16RR | 2/18/2010 | | 1.15 | | 0.06831 |
| | | OC-SW-PZ-16RRSW | PZ-16RR | 11/16/2012 | | 0.53 | | 0.031482 |
| | | OC-SW-PZ16RR-SW | PZ-16RR | 2/23/2012 | | 0.34 | | 0.020196 |
| | | OC-SW-PZ-16RRSW | PZ-16RR | 3/22/2011 | | 0.38 | | 0.022572 |
| | | OC-SW-PZ-16RRSW | PZ-16RR | 5/16/2011 | | 0.19 | | 0.011286 |
| | | OC-SW-PZ-16RRSW | PZ-16RR | 6/7/2012 | | 0.14 | | 0.008316 |
| | | OC-SW-PZ-16RRSW | PZ-16RR | 8/23/2011 | | 0.56 | | 0.033264 |
| | | OC-SW-PZ-16RRSW | PZ-16RR | 8/23/2012 | | 0.37 | | 0.021978 |
| | | OC-SW-PZ-16RR-XXX | PZ-16RR | 12/9/2010 | | 0.61 | | 0.036234 |
| | | OC-SW-PZ-16RR-XXX | PZ-16RR | 6/6/2011 | | 0.27 | | 0.016038 |
| | | OC-SW-PZ17RR | PZ-17RR | 11/12/2009 | | 0.77 | | 0.045738 |
| | | OC-SW-PZ-17RR | PZ-17RR | 11/15/2010 | | 0.79 | | 0.046926 |
| | | OC-SW-PZ17RR | PZ-17RR | 11/8/2011 | | 0.47 | | 0.027918 |
| | | OC-SW-PZ-17RR | PZ-17RR | 6/9/2010 | | 0.5 | | 0.0297 |
| | | OC-SW-PZ-17RR-0_2 | PZ-17RR | 2/18/2010 | | 0.63 | | 0.037422 |
| | | OC-SW-PZ-17RRSW | PZ-17RR | 11/16/2012 | | 0.92 | | 0.054648 |
| | | OC-SW-PZ-17RR-SW | PZ-17RR | 2/23/2012 | | 0.51 | | 0.030294 |
| | | OC-SW-PZ-17RRSW | PZ-17RR | 3/22/2011 | | 0.3 | | 0.01782 |
| | | OC-SW-PZ-17RRSW | PZ-17RR | 5/16/2011 | | 0.36 | | 0.021384 |
| | | OC-SW-PZ-17RRSW | PZ-17RR | 6/7/2012 | | 0.26 | | 0.015444 |
| | | OC-SW-PZ-17RRSW | PZ-17RR | 8/23/2011 | | 1.3 | | 0.07722 |
| | | OC-SW-PZ-17RRSW | PZ-17RR | 8/23/2012 | | 1.8 | | 0.10692 |
| | | OC-SW-PZ-17RR-XXX | PZ-17RR | 12/10/2010 | | 2.2 | | 0.13068 |
| | | OC-SW-PZ-17RR-XXX | PZ-17RR | 12/17/2012 | | 0.71 | 0.005 | U 0.0025 |
| | | OC-SW-PZ-17RR-XXX | PZ-17RR | 6/6/2011 | | 1.8 | | 0.10692 |
| | | OC-SW-PZ-18R | PZ-18R | 6/9/2010 | | 0.015 | | 0.000891 |
| | | OC-SW-PZ-18R-0_2 | PZ-18R | 2/18/2010 | | 0.022 | | 0.0013068 |
| | | OC-SW-PZ18R-RISK | PZ-18R | 11/15/2010 | | 0.023 | | 0.0013662 |
| | | OC-SW-PZ18R-RISK | PZ-18R | 11/8/2011 | | 0.0215 | | 0.0012771 |
| | | OC-SW-PZ-18RSW | PZ-18R | 11/16/2012 | | 0.02 | | 0.001188 |
| | | OC-SW-PZ-18RSW | PZ-18R | 3/22/2011 | | 0.016 | | 0.0009504 |
| | | OC-SW-PZ-18RSW | PZ-18R | 8/23/2011 | | 0.015 | | 0.000891 |
| | | OC-SW-PZ-18RSW | PZ-18R | 8/23/2012 | | 0.013 | | 0.0007722 |
| | | OC-SW-PZ-18RSW-RISK | PZ-18R | 5/16/2011 | | 0.012 | | 0.0007128 |
| | | OC-SW-PZ-18RSW-RISK | PZ-18R | 6/7/2012 | | 0.0165 | | 0.0009801 |
| | | OC-SW-SD17 | SD-17 | 11/12/2009 | | 0.62 | | 0.036828 |
| | | OC-SW-SD-17 | SD-17 | 11/15/2010 | | 0.85 | | 0.05049 |
| | | OC-SW-SD17 | SD-17 | 11/8/2011 | | 0.47 | | 0.027918 |
| | | OC-SW-SD-17 | SD-17 | 3/22/2011 | | 0.3 | | 0.01782 |
| | | OC-SW-SD-17 | SD-17 | 5/16/2011 | | 0.33 | | 0.019602 |
| | | OC-SW-SD-17 | SD-17 | 6/7/2012 | | 0.68 | | 0.040392 |
| | | OC-SW-SD-17 | SD-17 | 6/9/2010 | | 1.3 | | 0.07722 |
| | | OC-SW-SD-17 | SD-17 | 8/23/2011 | | 0.28 | | 0.016632 |
| | | OC-SW-SD-17 | SD-17 | 8/23/2012 | | 2.4 | | 0.14256 |
| | | OC-SW-SD-17-0_2 | SD-17 | 2/18/2010 | | 0.84 | | 0.049896 |
| | | OC-SW-SD-17-RISK | SD-17 | 11/16/2012 | | 0.85 | | 0.05049 |
| | | OC-SW-SD-1-XXX | SD-1 | 12/17/2012 | | 0.29 | 0.005 | U 0.0025 |
| | | OC-SW-SD-1-XXX | SD-1 | 12/9/2010 | | 0.23 | | 0.013662 |
| | | OC-SW-SD-1-XXX | SD-1 | 6/6/2011 | | 0.11 | | 0.006534 |

1 - Combine dataset is the combination of measured hexavalent chromium data and calculated hexavalent chromium data.

Calculated hexavalent chromium data was calculated by multiplying the total chromium results by a media specific ratio.

Media specific ratios used: Soil - 5.82 %, Sediment - 16%, Surface Water - 5.49%.